

THIS WEEK IN THE IRON AGE

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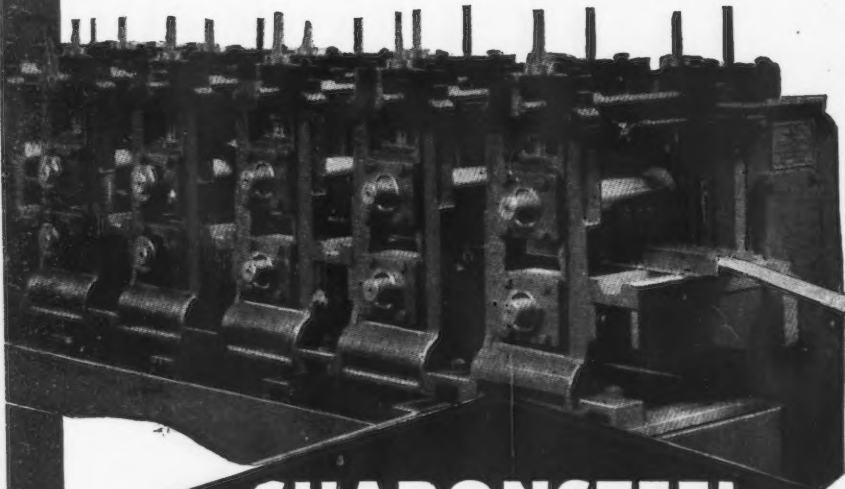
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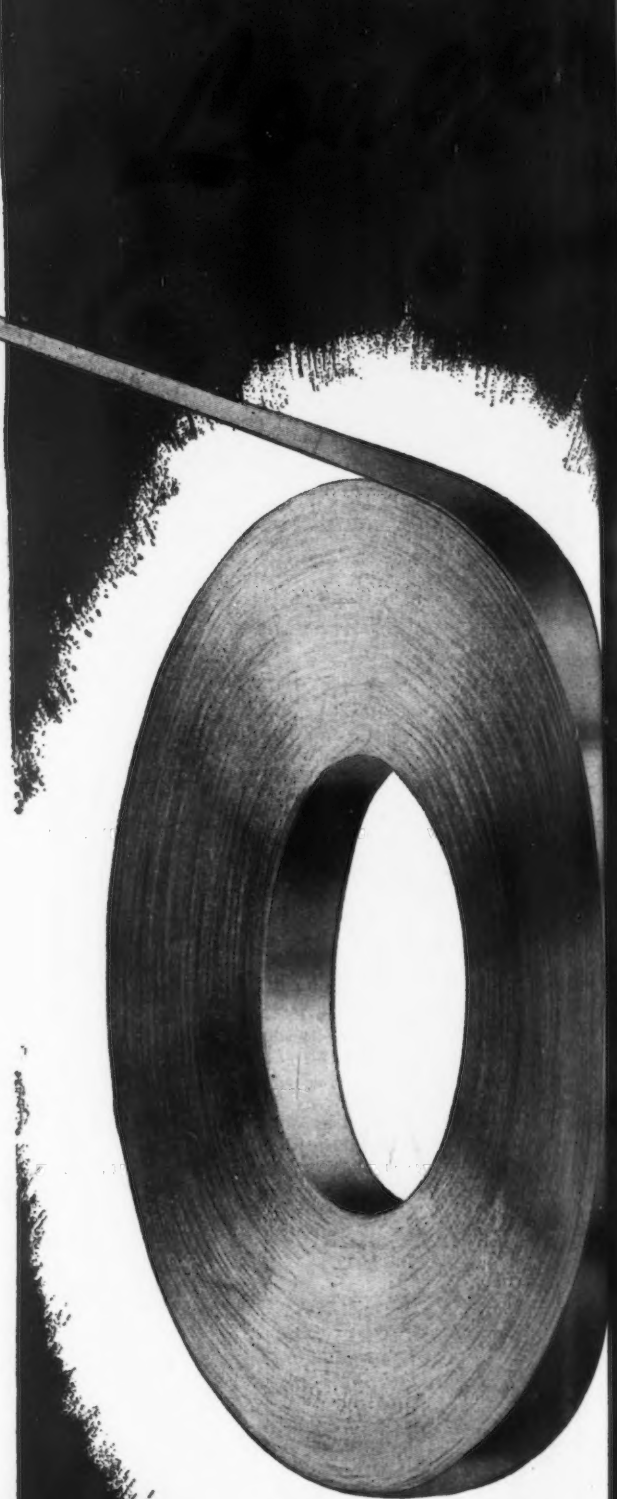
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Antiquated Practices

KING SOLOMON glorified the ant for his apparent industry; Mark Twain, centuries later, exposed this insect as a fraud.

In his "A Tramp Abroad," Mark tells of two ants who discover a grasshopper leg and proceed to carry it home; at least that is the general intention.

They take hold of opposite ends of the leg, relates the author, and begin to tug with all their might in opposite directions. Presently they take a rest and hold a conference. They decide something is wrong; they can't make out what. Then they go at it again, just as before. Same result. Mutual recriminations follow. Eventually each accuses the other of being an obstructionist. They warm up and the dispute ends in a fight. They lock themselves together and chew each other's jaws for a while; then they roll and tumble on the ground till one loses an antenna or a leg and has to haul off for repairs. They make up and go to work again in the same insane way, but the crippled ant is at a disadvantage; tug as he may, the other one drags off the booty and him at the other end of it. Instead of giving up, he hangs on and gets his shins bruised against every obstacle that comes in the way. By and by, when that grasshopper leg has been dragged all over the same ground once more, it is finally dumped at about the spot where it originally lay...

Evidently Mark did not think very highly of ant intelligence but he was born 50 years too soon. If he had lived in our day, he would say that people were just as stupid, for if you could find a better parallel than this to management-labor relations and the wage-price contest, I don't know where it would be available.

The two ants would have been immeasurably better off and would have filled their pantries more quickly if they had had sense enough to pull in the same direction. But that would not be as exciting as a tug of war and perhaps ants like excitement.

Maybe people do too. But when it comes to "bringing home the bacon," I call it *antiquated practice*!

J. H. Van Deventer

all agree...



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MANAGER



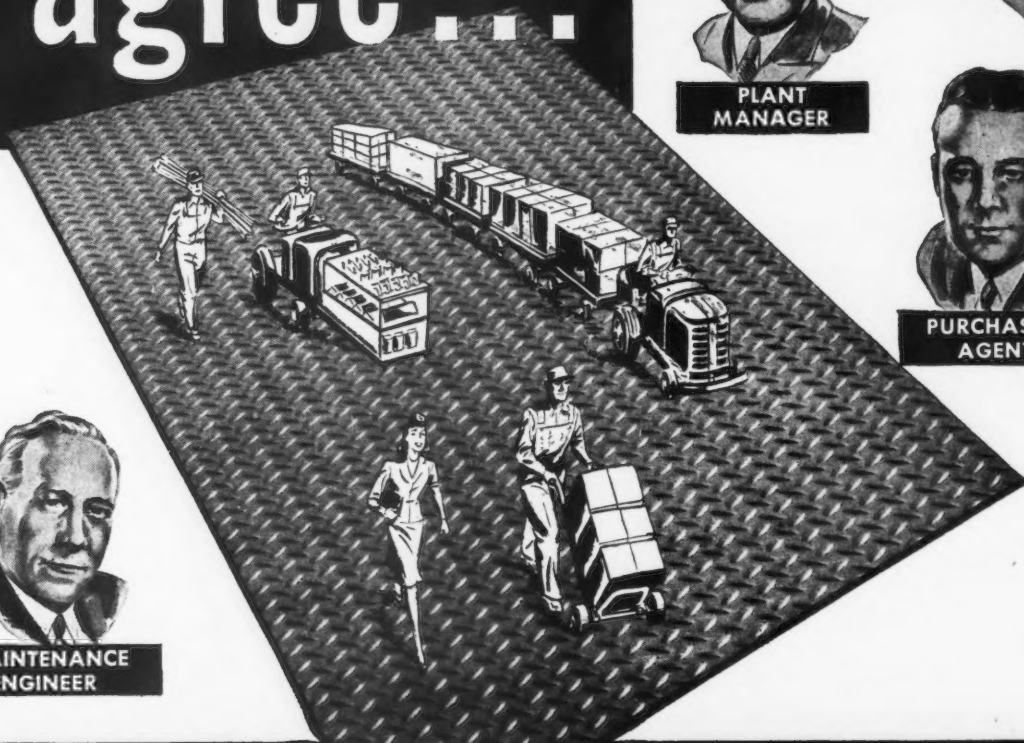
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► A medium-sized eastern manufacturing plant has just completed a careful survey of its raw material price increases which covered a wide variety of materials. The increase, covering the period from the end of the steel strike to the re-instatement of OPA amounted to 13 pct.

► It will probably be September before the steel industry is able to show the OPA an industry-wide picture of its cost-price relationship on major items. If the OPA then takes the legal 60 days to consider the data it may be December before these increases can be made effective.

► At the moment New England industry has comparatively little labor trouble. However, indications are that the CIO is getting ready to kick over the apple cart starting late in the Fall. The first indications are expected to come in the smaller plants.

► Unless freight car turn-around and equipment utilization can be speeded up Midwest shippers fear the most severe freight car shortage since 1921. The shortage of coal cars is forcing many steel users, Bethlehem among them, to operate on a hand-to-mouth basis. Carnegie-Illinois' South Works, Chicago, was forced to temporarily suspend operations in July when the car shortage clogged the delivery end of the mill.

► Among the items for which the Corps of Engineers has not received and does not expect to receive competitive bids this year are: Steel, lumber, plumbing and electrical supplies and equipment, as well as automotive type items like gasoline and diesel engines.

► On the drawing boards is a new 280-millimeter howitzer motor carriage, which will give the Army a mobile weapon designed to defeat the strongest fortifications.

The new bazooka, now under development, will have enough punch to blast holes through tank armor thicker than has yet been used. It will have greater accuracy to hit moving targets and roughly twice the former range.

► Model changes in most 1947 cars will probably not be sweeping but the industry is preparing to "shoot the works" in its 1948 models, scheduled for presentation about November 1947.

► With carbon steel near the top of the short supply list, automobile makers are turning away from water quenched carbon parts in favor of alloy steel parts quenched in oil. By cutting straightening costs the change is reported to offset the extra cost of alloy steel.

► Someone could do the auto industry a favor by producing low cost dies for short runs of parts. Non-functional, or replacement parts are now in short supply due in part to wartime scrapping of dies. One auto maker reports that letters complaining of inability to get replacement parts are coming in at 20 times the normal rate.

► German steel mills, all propaganda to the contrary notwithstanding, closely resembled American mills at the turn of the century. No attempt was made to produce high grade steel in the openhearth.

► By employing V-type dies, a development of Barium Steel & Forge, Inc., for the forging of large diameter, high-alloy tool steel rounds, center rupture can be eliminated and uniform cross-sectional carbide distribution assured.

Not only does this process improve quality but also increases ingot yield up to 25 pct. Appreciable time saving is also achieved.

► Contrasting sharply with the ingenuity displayed in most German manufacturing processes, forging techniques appear to have lagged as much as 25 yr behind those of the United States.

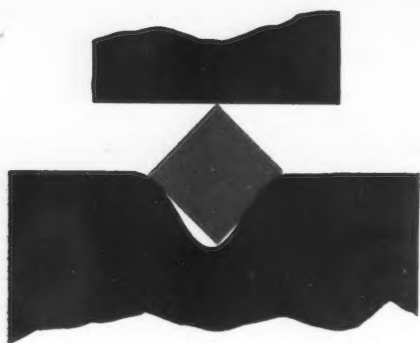
However, in one or two isolated cases practices were found that were superior to American practices. One of these was the forging of gun breech housings at the Krupp plant and the manufacture of cast die blocks at Ruhrstahl in Annen for such items as propellers, propeller hubs and crankshafts.

► Development of processes for production of steels with low sulfur and phosphorus content during the war enabled the Germans to save alloying metals and maintain mechanical specifications.

► An ingenious method of making iron powder for soft iron driving bands for shells was developed by Krupps to save copper. Molten iron was poured either into a water jet impinging on rotating blades or into a high pressure jet of mixed steam and air.

► Exporters fear that the new CPA limited priorities assistance program will give them little assistance. Instead they believe the government intends to use it to direct items in short supply to European countries which the State Dept. particularly desires to help.

► Correction: In the item on this page dated July 23 covering the export of steel to the U.S.S.R. and Bulgaria the reference to Britain was in error. The nationalized industry negotiating with these countries is that of Poland.



Forging High-Alloy

o o o

By Elmer Ghrist
Assistant Chief Metallurgist,
Jessop Steel Co., Washington, Pa.

o o o

HIGH speed and high-alloy tool steel rounds up to 12 in. diam can be successfully forged, with a reduction of residual strains, the elimination of center bursts and the assurance of a uniform cross sectional carbide distribution, by a process developed at Barium Steel & Forge, Inc., by Glenn W. Shetler, vice-president. The metallurgical staff of Jessop Steel Co., furnished the ingots for the development work and investigated the physical, metallurgical and metallographic characteristics of the product resulting from this process.

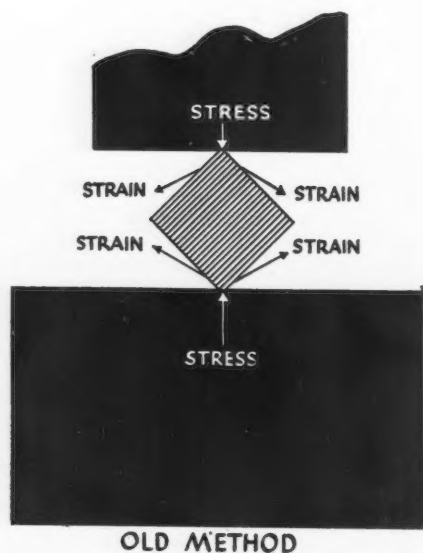
Several factors have heretofore prevented the successful production of high-speed and high-alloy steel rounds in diameters greater than 5 in. Two of the outstanding ones have been (1) the inability to obtain proper refinement of the structure (proper carbide distribution) by means of hot working, either by conventional pressing or hammer swaging methods, and (2) the unusually high scrap loss due to center rupture or burst, occurring in the transition from square to round shapes.

Elimination of the first difficulty, theoretically, can be accomplished by increasing the percentage of reduction from ingot to finished product. However, as

ingot size is increased, hammers and presses of larger capacities are required to insure sufficient hot work in order to penetrate the product and to assure a central carbide distribution of acceptable character. Unfortunately, as the ingot size is increased the tendency to center rupture or burst increases.

The problem evolves itself into a "teeter" somewhat of the following nature: When ingot size is sufficient to insure proper refinement of structure, scrap loss, because of center rupture, is excessive; when ingot size is decreased to limits where center rupture is a minimum, refinement of structure is not satisfactory. As a result, manufacturers of high-speed and high-alloy tool steels have had to compromise and use the smallest possible ingot that would give an acceptable structure with a resultant minimum of scrap. Obviously, the resultant restriction of size range has imposed a distinct penalty upon both the steel producer and the fabricator of large tools.

Realizing the potential sales volume in large diameter high-speed and high-alloy tool steel rounds, development work was carried out, resulting in a new method of hot working steel. The new method employs a constraining action that restricts sidewise spreading

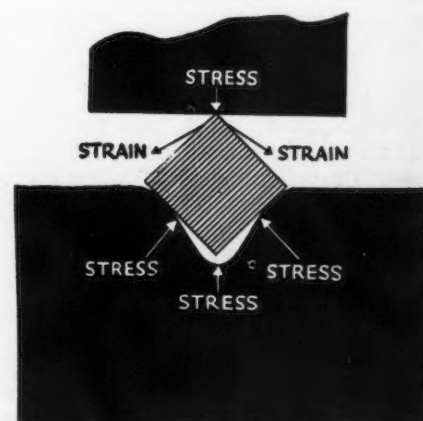


OLD METHOD

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FIG. 1—Conventional die arrangement for forging squares into rounds is shown here. The two flat type dies offer no restrictive action to the sides of the forged billet and when forging large diameter alloy rounds, center rupture is common.

o o o

RIGHT
FIG. 2—By the use of the V-type die, restrictive action on the sides of the forging reduces by some 50 pct the strain characteristics caused by the forging action and eliminates center bursts in large alloy forgings.



NEW METHOD

Rounds With V-Type Dies

A new method of forging large-diameter, high-alloy tool steel rounds which is said to eliminate center rupture and assure uniform cross-sectional carbide distribution is described in this article. This method, which employs V-type dies, was developed by Barium Steel & Forge, Inc., with the metallurgical assistance of Jessop Steel Co., permits successful forging of high-alloy rounds up to 12-in. diam.

of the billet. This serves to eliminate center rupture and imparts a kneading action throughout the entire cross section. The kneading action refines the structure to a degree heretofore not possible with conventional hot working methods. A consideration of the mechanics involved in hot working illustrates the obstacles to be surmounted.

In conventional methods of hot working, either by pressing or hammer forging, the strain distribution characteristics are approximately as shown in fig. 1. As the corners are being laid down in the preliminary steps of the square to round transition, no mechanical action is developed that would inhibit the free sidewise spreading of the billet, as shown by the stress indications in fig. 1. Examination of numerous hot acid-etched disks selected at this stage of the hot working sequence revealed incipient cracking at the

center of the billet. The continued work necessary to place the billet in a near round for final swaging serves to aggravate the condition and results in center rupture. Further, in conventional forging practices on large diameter high-speed and high-alloy tool steels the inability of the method to restrict the free sidewise spread of the billet decreases the penetration of mechanical work, and, thus, structural refinement of the central section of the bar is minimized. As size range is increased, center rupture becomes more prevalent and structural refinement is proportionately mini-

o o o

FIG. 3—Sizing rings of the diameter desired in the finished round are inserted into the V-die, and the clearance between the flat surfaces of the top and bottom dies, is maintained by square sizing pegs laid on the face of the bottom die.

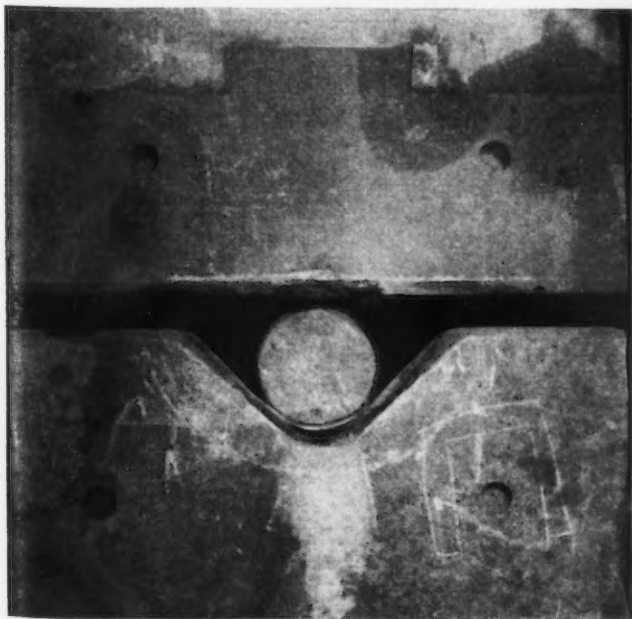


FIG. 4—As the corners of the billet are laid down, an octagon about the diameter of the finished size is obtained. This shows the octagon from the front manipulator.

o o o

mized. As previously mentioned, heavy scrap losses on large diameter high-speed and high-alloy tool rounds because of center rupture, and rejections due to unacceptable central carbide distribution, have placed a restriction upon the range of sizes which can be produced successfully and economically by conventional forging practices.

In the new method, the principal disadvantages of the conventional forging practice have been overcome by use of the V-type anvil die. As a preliminary step the ingot is worked to a square billet on a 1500-ton

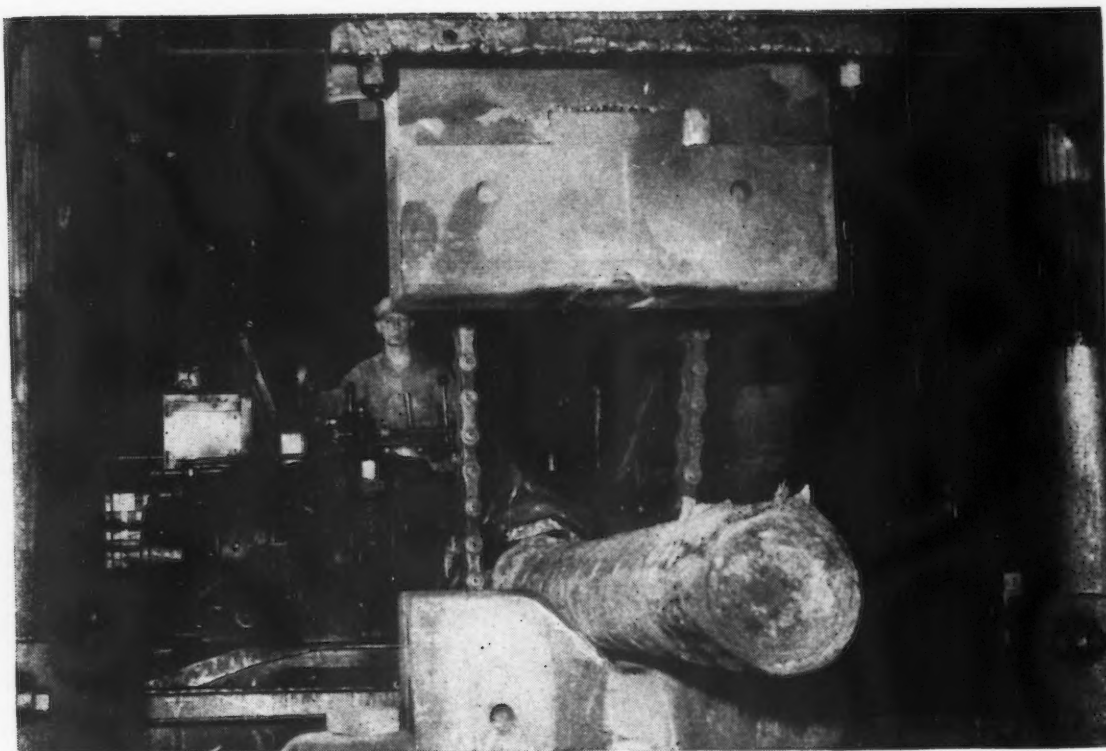


FIG. 5—The octagon is worked to a smooth forged round of the desired size and subsequently rough machined to prescribed tolerances.

press, with front and rear manipulators of 3- and 15-ton capacities, respectively. Dies used for this operation are conventional flat dies. Experience has shown that the billet should be squared up to a size at least 3 in. larger than the desired diameter of the finished round bar, i.e., a 12-in. sq billet should be used to produce a 9-in. diam round.

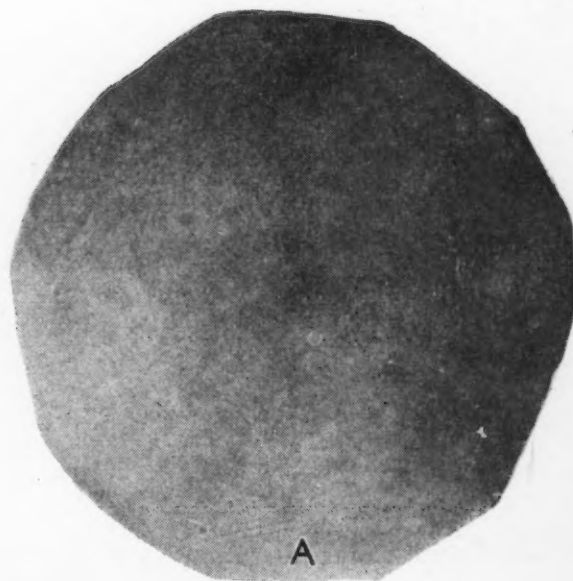
After the ingot has been worked to a square billet, the billet is recharged into the furnace and the flat anvil die is replaced with the V-type die for forging to the desired finished round dimension. The required diameter of the finished round determines the size of the V-die necessary to produce the required bar size. It is not, however, requisite that V-dies be provided for each particular desired round size, since a range of sizes can be produced in each V-die. That is, rounds in the range 5.5 to 7.5 in., inclusive, may be produced with one die set. Sizing rings of the same diameter as the finish round are inserted in the V-die and the press lowered until contact is made with the sizing ring, as shown in fig. 3. The clearance between the flat surfaces of the top and bottom dies, necessary to produce the desired finished round size, is maintained throughout the forging sequence by use of square sizing pegs inserted on the horizontal faces of the bottom die.

The sequence of hot working operations in the V-die is similar to that used in conventional forging practice. The billet is placed on edge in the V-die, as a diamond, the top corner is laid down, the billet is rotated 90°, and the new top corner is laid down. Continued rotation of the billet and laying down the corners results in the formation of an octagon approximately the same diameter as the finish size, as shown from front manipulator in fig. 4. Final forging converts the octagon to the smooth forged round of desired size, as shown in fig. 5, and this round is subsequently rough machined to prescribed tolerances.

Although the sequence of hot working operations in the new method is similar to that used in conven-

tional practice, there is a marked difference in strain distribution characteristics and, hence, in the distribution of mechanical work applied to the product. Analysis of the action developed by the V-die indicates that the strain characteristics (side bulging) are reduced by approximately 50 pct compared with the conventional flat die method. Consequently, center rupture is eliminated. The marked reduction in side bulging is attributable to the constraining action developed by the walls of the V-die, which serve to restrict the free sidewise spread of the billet as the corners of the square product are laid down. The concentration of hot work applied to the billet by the

Fig. 6—A—Top cut of the forging.



constraining action of the V-die walls provides for deeper penetration of hot work into the product. This assures center working of the billet and a resultant carbide refinement not possible by other methods.

In order to picture the action developed by use of the V-die it is convenient to illustrate schematically the elementary mechanics of the conventional and the new method of hot working steel, figs. 1 and 2, and also to consider the factors of importance in the design of the V-die.

Of prime importance in the entire operation is the proper design of the V-die. Two important considerations in the design of the die are provision for sufficient radius at the base of the V and proper radius relief at the front and rear faces of the die, always present in V-die constructions. Failure to provide proper radius at the base of the V results in insufficient clearance and the formation of laps. A lack of radius at the front and rear faces of the die results in a shearing action along the billet.

Aside from the improvement in the quality of the finishing product when V-die-forged, the Shetler process increases ingot yield up to 25 pct. An appreciable time savings in the forging operation is also realized. The time saving is readily observed by examining the forging cycle for each method. The forging cycle for the conventional method is:

- (1) Ingot
- (2) Square billet
- (3) Anneal
- (4) Condition
- (5) Octagon
- (6) Round

The forging cycle for the V-die method is four stages:

- (1) Ingot
- (2) Square billet
- (3) Octagon
- (4) Round

Elimination of the intermediate annealing and conditioning treatments is possible because of the action of the V-die.

The presence, or absence, of center rupture in a forged bar is easily determined by examination of hot-acid-etched disks. However, the degree of structural refinement is not so apparent. For this reason, metallurgical investigation was conducted under the author's direction of the structure of a 7-in. round of Jessop Supremus 18-4-1 high-speed tool steel bar, V-die forged. The method of investigation, results and conclusions are as follows:

Sampling Procedure and Identity—Three disks, $\frac{1}{2}$ -in. thick by 7-in. round, were selected for examination. The disks were identified as: B4880T, B4880M, and B4880B. The suffixes T-M-B denoted billet location with respect to ingot position—top, middle, or bottom cut.

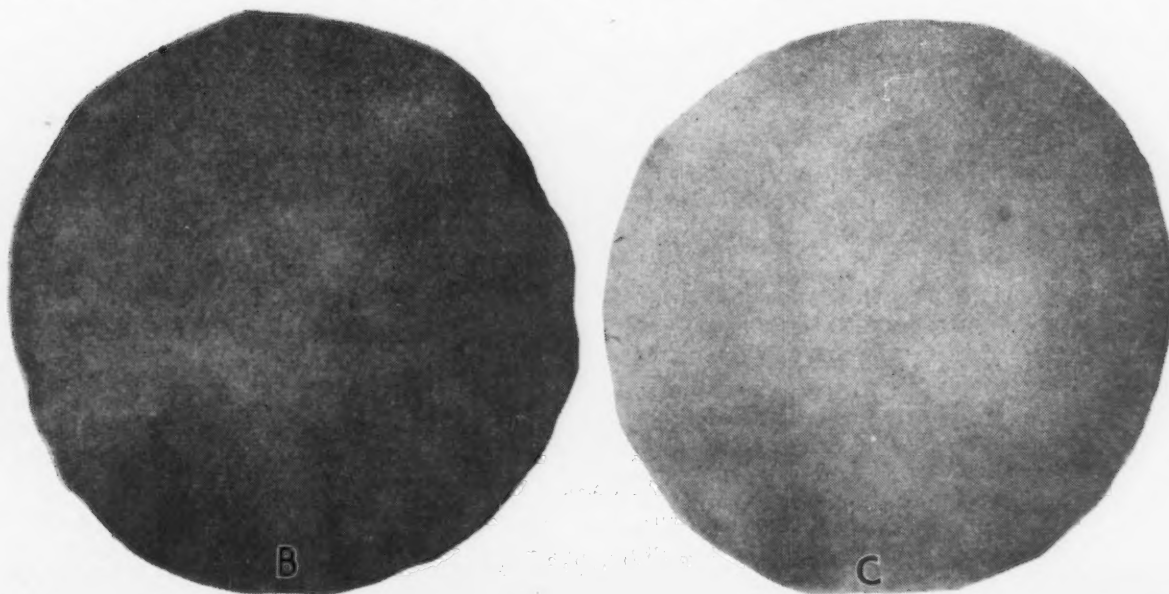
Hot Etch Structure—The disks, faced up prior to hot etching on a Thompson surface grinder to a finish equal to that imparted by a 120 grit wheel, were hot etched, face up, for a period of 1 hr in a 50 pct aqueous solution of HCl held at 160°F , $\pm 5^{\circ}$. Under this etch no objectionable porosities or segregations were observed in either the middle or bottom cut disks. However, the top cut revealed several pin point porosities, attributed to insufficient croppage. This assumption was confirmed in that by cutting back 4 in. and re-etching, all porosity was eliminated. Of particular importance was the observed absence of bursts or center rupture, common to high-alloy steels hot worked in the conventional manner. Photomicrographs of the hot etched disks are shown in fig. 6.

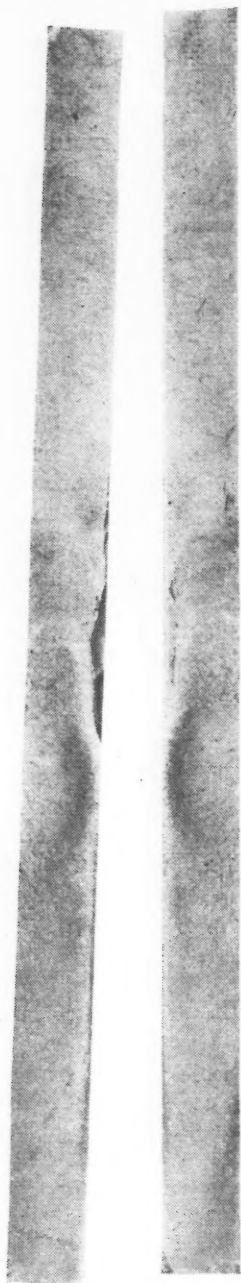
Annealed Hardness—center = 241 Bhn (3000 kg. load). Periphery = 235 Bhn (3000 kg. load).

Microstructure—Samples for microscopic examination of the annealed structure were selected from the center and from a position two thirds the distance between the center and periphery of disk B of fig. 6. The sample prepared from a hardened and fractured disk for microscopic examination was cut two thirds

• • •

showing the hot etched face. B—Middle cut, showing hot etched face. C—Bottom cut, hot etched face.





RIGHT

FIG. 7—A—Center section of the annealed disk showing the maximum carbide segregation (200X). B—Section two thirds the distance from the center to the periphery of the sample (200X). C—Hardened from 2350°F and tempered 2 plus 2 hr at 1050°F, this sample had a hardness reading of 65 to 66 Rc. It was necessary to go to 1500 magnifications to obtain resolution of the heat treated structure comparable with that of annealed structures.

o o o

LEFT

FIG. 8—Both fracture faces of a sample of a forging produced by this Shetler method. The fracture grain size of hardened and tempered samples varies from No. 8 to 9.5, rated in accordance with Shepherd's fracture grain size standards.



the distance from center to periphery of disk C of fig. 6. Disk B of fig. 6 was selected for study of annealed structure for the obvious reason that it should best represent an average condition with respect to both the steel quality and the effect of forging upon structure. All samples were ground and polished parallel to the longitudinal axis.

The photomicrographs, fig. 7, represent samples selected and prepared as described. Fig. 7A shows the center section of annealed disk, exhibiting the maximum carbide segregation. Absence of carbide envelopes is apparent. Fig.

7B is the section two thirds the distance from the center to periphery of the specimen. Spheroidal carbides are well dispersed. Complete absence of carbide segregation is apparent. Fig. 7C shows the hardened and tempered structure. Hardened from 2350°F and tempered for 2 plus 2 hr at 1050°F, the hardness reading was 65 to 66 Rc. The carbide distribution in a well tempered martensitic matrix is uniform.

Fracture Grain Size—The fracture grain size of the hardened and tempered samples vary from No. 8 to 9.5, rated in accordance with Shepherd's fracture grain size standards. The coarser grain size is at the center, the finer grain nearer the periphery. The photomicrograph shown in fig. 8 includes both fracture faces.

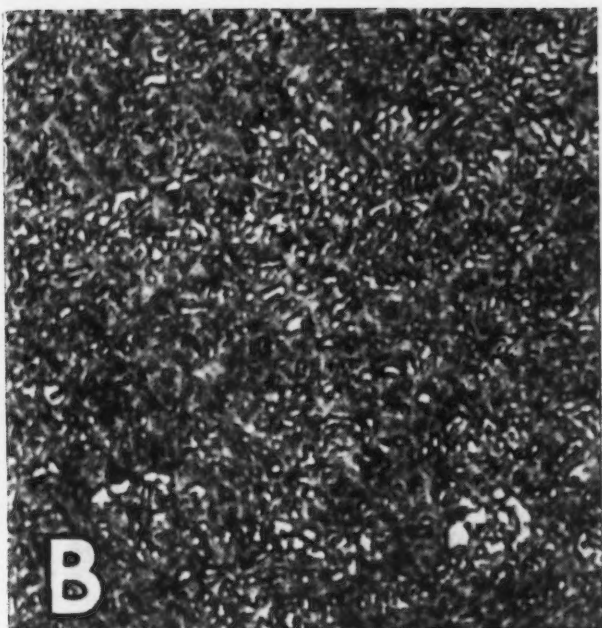
The proved metallurgical benefits, the decrease in scrap loss due to elimination of center rupture, and the availability of V-dies for producing a broad range of sizes in the high alloy tool steel category have created widespread interest in the machine tool and die fabricating industries. At present, large diameter

rounds, 6- to 10-in. diam, are being successfully produced in Jessop 18-4-1 and 6-6-2 Veeoginized high speed steel types, high carbon-high chromium air hardening die steels, hot work die steels, and manganese non-deforming tool steel. While only limited performance data are at present available, repeat orders from a number of steel producers for large alloy tool steel rounds seem to prove the worth of the new method and new product. Suggested applications for large diameter rounds include, among others: Milling cutters, arbors, scalping dies, hobbing blanks, and broaches of high speed tool steels; cold trimming, stamping, forming, and blanking dies in either oil or air hardening analyses, depending upon type of material being processed; and gripper, upsetting and forging dies in the hot work field.

The practice among fabricators of tools and dies has been to purchase upset forgings and machine to desired shapes when large tools are required. This practice has been made necessary for several reasons. Large diameter tool steel rounds were previously not available, for the reason that heavy scrap loss incurred by manufacturers, because of center rupture, discouraged their production. Past experience had shown that conventional methods of hot working large sizes did not produce a product with sufficient structural refinement to guarantee uniform and consistently reproducible service performance. Because of the insufficient structural refinement, difficulty was experienced in heat treatment.

Normally upset forged disks are supplied a minimum of $\frac{1}{8}$ -in. larger in all dimensions than the required finish size of the machine tool or die. The great amount of machining required to bring the upset forged disk to desired size is both time consuming and costly. With the development of this new method of hot working in the V-die, large diameter rough turned rounds may now be obtained with tolerances quite close to those desired in the finished item, eliminating costly and time consuming machining operation previously necessary when upset forged disks were used.

The advantages of producing large diameter high alloy tool steel rounds by use of the Shetler process are shared alike by both the steel producer and fabri-



cator, and are reflected in increased ingot yield, improvement of structural characteristics, absence of center rupture, and a saving in time and machining costs to the fabricator of machine tools and dies. The

proved advantages of the new method are justification for the confidence shared by tool steel producers, including Jessop Steel Co., and Barium Steel & Forge, Inc., in both the process and the product.

Electropolishing of Silver

An electropolishing process, described as electroplating in reverse, which replaces manual and mechanical buffing, has been developed by Oneida, Ltd., and Arthur D. Little, Inc., Cambridge. The process has been used for more than a year by Oneida for polishing plated silverware. The process involves a current opposite in direction to that employed for ordinary plating and removes metal preferentially from high spots to produce a polished surface, according to Arthur D. Little, Inc. The polishing method employs an alkaline cyanide bath much the same as that used for silver plating, and does not require heating. Current density is in the

low plating range. Silverware may be polished on the same racks on which they are plated and the technique is said to be suitable to automatic operation.

See also "New Method for Polishing Silver," THE IRON AGE, p. 65, June 6, 1946.

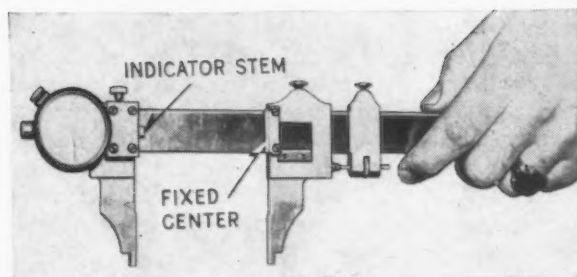
tion. Time required for polishing depends on surface condition, but is in the range of 5 to 20 sec and only a few percent of the silver is removed. Metals other than silver, for example, cadmium, may also be polished with this technique, according to the Little company.

Accurately Setting Trammel Points

In scribing comparator charts, considerable inaccuracy and eyestrain resulted from the customary use of trammel points and dividers with a scale graduated in hundredths. To overcome this, engineers at Westinghouse Electric Corp. developed a simple apparatus which will regularly maintain a dimensional accuracy of ± 0.0001 in.

As shown in the accompanying illustration, this consists of a vernier caliper fitted with a 0.001-in. dial indicator, the stem of which has been ground flat and cross drilled to act as a center point. A fixed center point is mounted on the sliding member of the caliper. By using gage block center points set to 1 in. with the vernier caliper set at 1.000 in., the dial indicator is set at zero.

Setting the micrometer trammel, or dividers, then involves nothing more than adjusting the caliper to the desired dimension and placing the trammel or divider points in the two center holes and making



the adjustment to bring the dial indicator reading to zero.

For dimensional accuracy, it is recommended that the charts be made on 1/32-in thick Vinylite, which has a very low coefficient of expansion. One side of the sheet may be sprayed with lacquer for better visibility of the scribed lines. Another aid in preparing these charts is a tracing table with a frosted glass top with fluorescent lighting underneath.



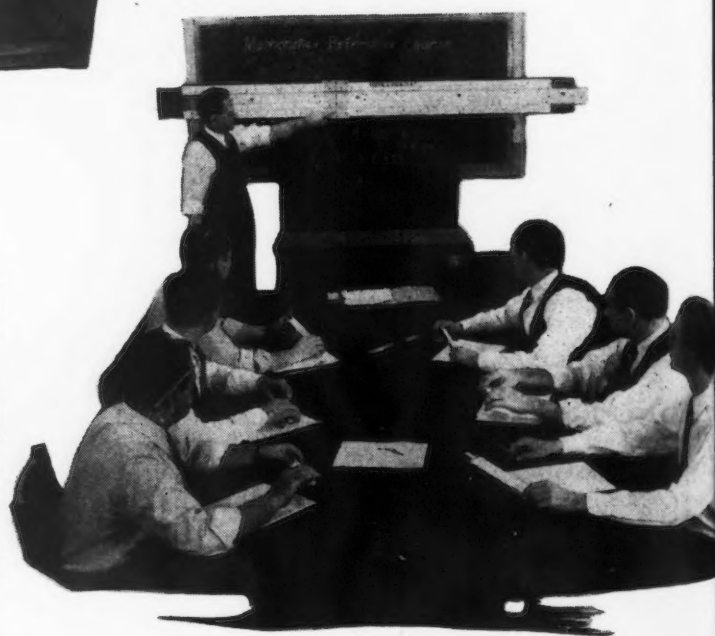
Training Time Study

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By T. R. TURNBULL

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Mathematic Refresher Course

TIME STUDY is the "technique for measuring the normal performance of an average qualified operator and establishing a standard time allowance covering it."

Thus, time study is an important tool of modern management which, if it is well designed, constructed and operated, can be very effective and productive of benefits to management, labor and the consuming public. While it is not a perfect tool, if it is installed by qualified time study men and used by a management which understands it and accepts the responsibility for its proper functioning, it can produce results satisfactory to all concerned.

As enterprises become more and more competitive, and wages move higher and higher, a standard measurement of productive requirements becomes more and more necessary. This standard measurement is needed primarily for wage payment and secondarily for cost control, production scheduling and machine loading.

Management, which elects to use this tool, must accept certain responsibilities in connection with it. Certainly no good management would purchase or design and install an intricate piece of production machinery without attempting to understand its operating advantages and limitations. Much of the trouble encountered with time study in the past has been due to management's ignoring three important points: (1) The necessity of using only well-trained time study men to establish standards; (2) the necessity of continual and proper maintenance of standards once established and (3) the necessity of making supervisory employees a part of time study through giving them a complete understanding of it.

When a management accepts the responsibility for time study work, sees that the proper time study techniques are used, and accords the time study department the prestige of proper placement in the organization, then establishing a training program for qualifying time study men is necessary and worthwhile.

If management is not willing to organize properly

for time study work and have this organization report to a responsible executive, and to believe in the necessity for training supervision in the understanding of the tool and assume full responsibility for time study as a major function of management, the program had better not be started for it will surely encounter difficulties and probably break down.

Company policies regarding time study, job evaluation and wage incentives should be codified into manuals. These manuals should be prepared, regardless of the size of the company, to serve as the authority for operation in the fields covered by them. They will, therefore, form a very important base upon which to build a training program.

Time study standards determination involves the use of techniques and a "technique is the skillful use of any art." So training must be given to develop the necessary skills in the use of time study techniques according to established principles and procedures, so as to properly qualify the time study men who are to install and assist in the operation of this management tool.

Men . . .

Conversion of industry to competitive peacetime production has focused new attention on the value of time studies as a management tool. This article presents a complete program for training of time study men, listing, step by step, procedure for developing men with practical knowledge and a thorough understanding of the philosophy of time study application.

Time study departments usually have three different grades or classes of personnel: (1) The supervising senior who is responsible for the overall time study activity; (2) the analyst, or senior time study man, who lays out the specific pattern of work to be done, and (3) the observer (time study man) who makes the studies or does the measuring.

It is with the training of these observers that we are initially interested, for the other personnel will be developed from experienced observers. Training or orientation, or both, should be given to all who are to engage in time study work. The extent of the training or orientation depends on the previous experience of the trainee and the organization of the department.

A well-designed program for presenting time study technique with facilities for giving real training on a formalized basis becomes a necessity if one is to discharge his responsibility to train properly qualifying

Candidates for positions as time study men fall into the following general classes: (1) Time study men who have had some experience with other concerns; (2) graduate engineers or college graduates without experience, and (3) members of the organization (usually with high school education) who have been serving as production checkers, junior supervisors or key operators.

Prerequisites for Candidates

Obviously, the training necessary to produce a qualified time study man will vary with the different classes of applicant, and within the classes, with the type of time study work on which he is to be used. A successful time study man must have, or be able to develop, certain characteristics: (1) A good personality, which involves ability to get along with people, self control, ability to express himself, salesmanship, etc.; (2) good judgment, analytical ability, thoroughness and energy.

After an applicant has been selected, decision must be made as to the point in the training program at which he is to enter. A trained engineer would not be given elementary mathematics or use of the slide rule, while someone selected from the factory, because of his potential, must be given the most elementary material. But even if the applicant has had experience with another concern he must be oriented in the techniques and procedures of his new environment.

For these reasons, the training program should be divided into phases which may be given to individuals or groups depending on the requirements. During the past several years in larger organizations there has been sufficient turnover to warrant training in groups, but the time is probably near when most additions will be single entries and a training procedure must be sufficiently flexible to accommodate this situation, by offering exactly the same material to individuals as has been presented to groups.

A logical division of the work to be presented in



Stop Watch Reading

Elemental Job Breakdown

time study men. It has proved dangerous to attempt to give training and understanding through nonformalized apprenticeship. For, in such instances, the learner is certain to acquire all of the bad practices of the person to whom he is apprenticed, and there is no way for either the supervisor of the time study department, or the management, to be sure that approved techniques are being acquired.





Use of Speed Indicators

such a training program arranges it for three phase presentation; (1) Elementary; (2) intermediate and (3) advanced.

Elementary Training

The elementary or primary phase can also be divided into three parts: (1) mathematics refresher and slide rule course; (2) methods analysis course and (3) an introduction to time study course. This primary phase is really an orientation program designed as a means of introducing candidates into the field. They will be explained the philosophy of time study as a management tool and will be given an explanation of the function it plays in the operating organization.

The relationship of the time study man with the supervisory employees and the worker, with the rules of conduct which he must follow in his daily contacts

time study work, so its use must be taught early in the training program and can logically be included as a part of the mathematics refresher presentation.

Methods Analysis Course:—Before a time study measurement can be made of an operation, the method, materials, tools and equipment used must be standardized. This is a function of time study which is too often neglected, and a man who is to engage in time study successfully should become thoroughly familiar with operation analysis. This standardization and analysis can be best accomplished by using work simplification, the flow process chart, man and machine chart, right and left hand chart and micro-motion analysis. So the time study trainee must be familiar with these tools during his training.

An appreciation of time study and the factors which make it up should be an attribute of all mem-

bers of an industrial organization using it. In order to accomplish this a training program of an elementary nature should be devised to give this appreciation. This program should involve: (1) use of the stop watch; (2) elemental breakdown; (3) performance rating and (4) application of allowances and working up of the standard. An appreciation presentation can be given in five 2-hr sessions for supervisors, etc. This same program can

Factory Practice Studies



then be amplified as the introduction to time study courses to be given in the first phase of the program of training time study men.

The principal tool of time study is the stop watch and instruction in its use is one of the first steps in the training of a time study man. A sufficient number of practice observations must be made using the watch to insure ease and accuracy in its use, and it is helpful to have a method of presenting predetermined elemental times for these observations, so that the trainee's ability to correctly use the watch may be evaluated.

come proficient in evaluating the differences in operator pace.

After the student has mastered the use of the stop watch, learned to breakdown simple operations into their elements and rate the performance of an operator, he is ready for instructions on the application of fatigue and personal allowances and the computation of the standard, which completes the elementary phase of his instruction.

The next step is the intermediate or secondary phase of the training program. This is the most important part of the training and the entrance is made

Industry Expands Use of Time Study

By RALPH M. BARNES

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INDUSTRY is taking renewed interest in time study and wage incentives, and there is a very definite trend toward the employment of more competent and better trained time study men and toward a systematic program for standardization of the time study methods. Closer scrutiny of the accuracy and consistency of time standards is being made by top management.

Also there is a feeling that with the substantial increase in hourly rates, greater attention must be given to work measurement. There is an apparent belief that the time has come to establish a standard day's work for all direct labor in the factory and to let the worker know each day whether or not this standard has been met.

The president of one large company with some 75 plants recently inaugurated a program to standardize the time study procedure in all of his company's plants and to train all time study men in the standard technique in order to obtain a greater accuracy and consistency of standards in the company's plants.

A group of manufacturers in a Midwest industrial area recently organized a time study clinic for the purpose of comparing the "amount of work" required for "normal performance" in each of the participating plants. Just as surveys have been made to determine whether a given company in a community is paying the going hourly wage rate, so a time study survey is conducted to determine whether a given company is expecting more or less effort from its employees than other companies in the community.

Industry seems to realize, now as never before, that work can, and must be measured, that it is management's job to see that it receives a normal day's work for the wages paid. Industry is recognizing that time study is the only satisfactory tool that can be used to measure work and that this tool is satisfactory only if it is employed by high-caliber men who are thoroughly trained.

A job must be broken down into its finest parts or elements, which can be readily recorded and timed as a basis of good time study. Correct elemental breakdown is one of the most important requirements of good time study, so considerable time must be spent in acquiring an understanding of the correct breakdown technique. Many failures in time study applications can be traced to poor elemental breakdown, and a good job of maintenance of standards is impossible unless the importance of elemental breakdown is realized when standards are set. Too much emphasis cannot be placed on this subject in the training program.

Performance rating is the evaluation in relation to normal, placed on the operator's actual performance by the time study man, and is the foundation of all good time study work. Skill in this important function must be built up during the whole training program. Rating practices and instructions should be carried on through the use of laboratory operations and moving pictures and other visual education aids prepared for the purpose, until the student has be-

come into the intricate details of good time study. The candidate will be carried through a scheduled routine of text book assignments and through more complete and intensive training in performance rating. As far as possible all of this phase should be conducted on a laboratory basis, so that there does not have to be any instruction of trainees on the factory floor before supervision and operators. Thus, when the trainee does appear on the factory floor he is able to go about his assignment with a minimum of hesitation, confusion and instruction.

Introduction to the compilation of standard data should be given in this phase and the time study manual, which is the bible of any well-organized time study department, should be introduced as a text for work assignments. A series of written tests should be used here to check the accomplishment and understanding of the trainees. They should cover the text material, the time study manual and practical problems involving the work covered to date.

At the close of this phase the trainee will be given factory practice studies to do. These studies will be



Machine Allocation

made on a series of typical factory operations, upon which standards have already been established. The trainee works up his standards without seeing any of the original material. After he has made his elemental breakdown it is checked by the senior engineer, who is acting as his instructor, so that his study will follow the same breakdown as the established standard.

After completing his study he will write it up in complete detail according to the established procedure and the senior compares it, item for item, with the standard which is in effect, reconciling any differences which may exist between the trainee's work and the established standard. At the satisfactory completion of the intermediate phase the candidate is ready to do plant time studies under the guidance of an analyst or senior time study man.

If the laboratory training has been successful, the results of the practice studies will be so consistently near the approved standards that the trainee is given confidence in his ability as an observer, and will have passed an important milestone in his development into a qualified time study man.

The next step is to assign the apprentice to engineer a new job from beginning to end. He will work with the foreman and standardize it. He will work with the senior engineer in breaking it down into its elements and laying out the pattern of the observations to be made and the data to be collected and tabulated. The senior will arrange to check enough of his observations to be sure that he is on the proper track. Then, the apprentice will work up his data and determine the standards.

After the standards are determined he will go over them with the supervision and assist the foreman

directly responsible for the operation in explaining them to the operators, after which he will check in the standards with the operator until they have been met and satisfactory incentive earnings have been attained. When he has successfully established his first standards, another milestone has been passed in his training and he begins to feel additional confidence in his ability to properly establish equitable production standards.

This phase of his training will consume a varying amount of time, dependent on conditions. An apprentice may be kept on the establishment of standards on relatively simple operations for some time before going on to more complicated problems, or, if conditions warrant, may be carried into the third or advanced phase of his training, which involves consideration of more intricate time study applications.

Advanced Training

The advanced phase of time study training gives consideration to the more complicated aspects of standards determination, such as machine interference, advanced use of standard data, available idle time, machine allocation, etc.

Usually, this work is presented on an individual basis rather than to groups, as a part of a formalized apprenticeship after completion of the second phase of the program. Advanced text book material should be introduced for this work. In this phase the trainee will be familiarized with the job evaluation procedures of the company, as well as with the wage incentive manual, which formalizes the company's wage policies. After completion of this training he should be able to satisfactorily operate as a qualified observer in the time standards department.

A successful time study man must have the know-how to be an expert technician in his field and he has been chosen and trained to that end. He must believe in the work which he has been trained to do and approach it with a desire for accomplishment through honest, energetic cooperation with all concerned. His function is fact finding (how long should it take?) He has no direct authority for action. Some one else must use the facts which he presents. He must maintain an ethical attitude toward his work and deal honestly and fairly with all problems which he attempts to solve.

The antagonism which pervades the minds of many people on the subject of time study can only be eliminated by fair and open dealing on all problems connected with it and by an attempt at better understanding of it by all concerned. Enlightened management and time study departments should do all in their power to obtain this understanding through special courses of instruction for supervisors and workers and most importantly through the daily contacts of the time study man.

The use of well trained time study men with enlightened supervision and workers, by a fair and understanding management, will do much to eliminate the finger pointing which has so often been directed at time study.

Forging Practice in Wartime Germany

DURING the course of investigations into forge practices in Germany as a member of an investigating team of the Joint Intelligence Objective Agency, the author came to the conclusion that rather than mechanized forging equipment and procedures, or increased forging capacity, Germany relied upon the skill of the individual worker and the use of large crews throughout the entire war period. No great expansions of existing forge plants were made; equipment and methods were old; and very few women were employed in the industry.

A number of forge plants were visited, and while those of Ruhrstal, at Annen, and the Krupp plant at Essen had the best facilities in the way of presses, hammers and furnaces, it was evident that the industry as a whole was some 25 to 40 yr behind the best practice in the United States. One exception, however, was found in the case of the forging of gun breech housings during the latter part of the war at the Krupp plant, which had advantages over any of the United States forging procedures.

In producing these breech housings, the ingots were forged into square billets, generally on a 15,000-ton press, and cut to length under the press. A small hole was punched through the length of the part and this was then placed upright in a die. A special die mounted on the crosshead of the press formed both the large and small holes, both of which were held symmetrical with the outside square of the part. This method of manufacture decreased the material required by approximately 40 pct and cut down the number of rejections due to flakes. Some of the smaller breech housings were similarly forged on a 5000-ton

Contrasting sharply with the ingenuity displayed in most German manufacturing processes, forging techniques appear to have lagged as much as 25 yr behind those of the United States. Several of the leading German forge plants were investigated by the author, but in only one or two isolated cases were any practices found which were superior to American practice.

By C. W. HEPPENSTALL, JR.

*Vice-President, Heppenstall Co.
Pittsburgh*

press, but the disadvantage of the process is the long forging time required under the large press units. Analyses used for these forgings were: For small housings, 0.35 to 0.40 pct C, 0.30 to 0.40 Si, 1.20 to 1.50 Mn; for large housings, 0.35 to 0.40 C, 0.30 to 0.40 Si, 0.50 to 0.60 Mn, 1.50 min. Ni.

An unusual procedure was also found at Ruhrstahl, in Witten, where large octagonal big-end up ingots were cast with a square tonghold on the bottom of the ingot. The molds were of the open bottom type, and the tonghold was formed in the base plate.

At the various plants visited, the heating facilities for each forge unit were inadequate. Material handling methods for ingots were old; porter bars, turning devices, jib cranes and pinch bars were chiefly

TABLE I
Krupp Die Block Analysis

Grade No.	C	Si	Mn	P	S	Cr	Ni	Mo
HGS	0.55 to 0.60	0.20 to 0.40	0.50 to 0.70	0.03	0.03	0.60 to 0.80	1.50 to 1.80	0.15 to 0.20
HGSE	0.50 to 0.55	0.20 to 0.40	0.50 to 0.70	0.03	0.03	0.60 to 0.80	1.50 to 1.80	0.40 to 0.50
WA342	0.40 to 0.45	0.20 to 0.40	0.80 to 1.00	0.035	0.035	1.70 to 2.00	.....	0.15 to 0.20
WA402	0.45 to 0.50	0.60 to 0.80	0.90 to 1.10	0.03	0.03	1.10 to 1.30	.....	0.15 to 0.20
A11K	0.52 to 0.58	0.15 to 0.30	0.35 to 0.55	0.03	0.03	.....	.....	.....
A16K	0.75 to 0.83	0.15 to 0.20	0.35 to 0.55	0.03	0.03	.....	.....	.....

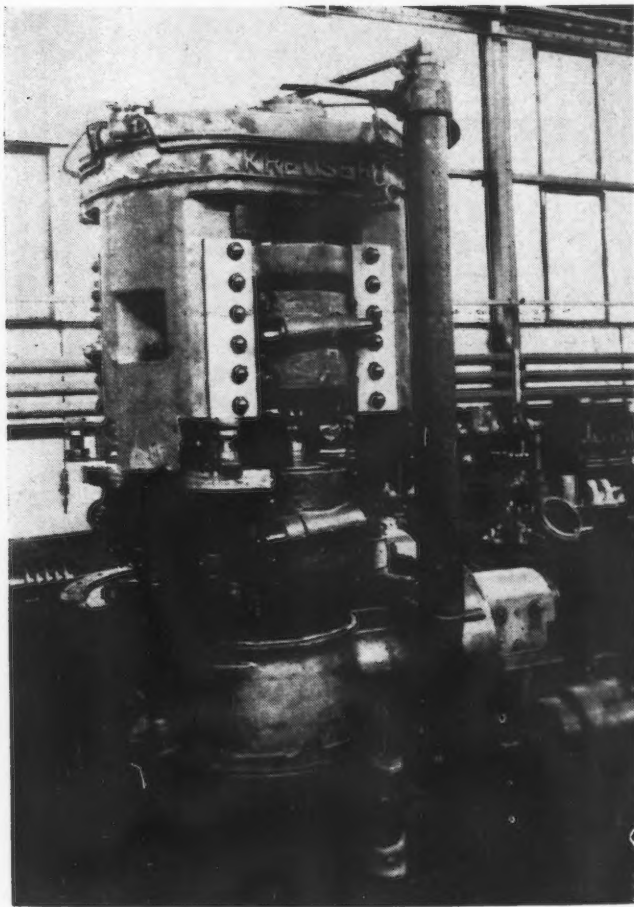


FIG. 1—Typical German ring rolling machine, of the vertical spindle type. These were made in considerable numbers, but had a very narrow range.

used. The two small manipulators seen were distinctly inferior to those manufactured in the United States.

In the opinion of the author, the plant layouts were not suitable for maximum production, as witness the case of the Krupp plant at Essen which had its heat treating plant for die blocks more than a half mile from the forging units. In general, heat treating facilities were much inferior to those in use in America. At Krupp, stationary bottom furnaces were used for much of the heat treat work, and at Ruhrstahl, in Annen, there were concrete quenching tanks protected with wood liners for water quenching. At no plant was there adequate oil or water quenching equipment.

Most of the die block manufacturing methods observed in the German plants were considered obsolete 25 yr ago by American forging standards. One unique technique, however, was that employed at Ruhrstahl, in Annen, for making cast die blocks for such items as propellers, propeller hubs and crankshafts. The die

TABLE II
Ruhrstahl (Annen) Die Block Analysis

Carbon.....	0.60
Manganese.....	0.50
Nickel.....	1.50
Chromium.....	0.70 to 0.80
Molybdenum.....	0.20

material ran 0.45 to 0.55 pct C, 1.20 to 1.50 Mn, 0.45 to 0.55 Si, 1.80 to 2.00 Cr and 0.20 to 0.22 V. The heat treating procedure was to heat the blocks to 1580°F, quench in oil and temper to a desired Brinell hardness, using a temperature of 900° to 940°F for a specific hardness. Significantly, the Witten forge plant of Ruhrstahl used only forged die blocks, and the most modern drop forge plant, that of the Opel works at Russelsheim, had only one set of cast blocks and would not use them.

In the manufacture of cast die blocks, the impression was cast in the downward position in dry sand molds and one or two risers were used on the dovetail side depending on the length of the block. It has been estimated that approximately 100 tons of cast die blocks were made per month.

Of the three die block producing plants visited, that of Ruhrstahl, in Annen, had a production of approximately 1000 tons a month, and was said to have manufactured between 60 and 65 pct of all the die blocks made in Germany. The Ruhrstahl works at Witten had an estimated production of 10 tons a month, while that of Krupp, at Essen, was approximately 200 tons a month for use other than in the Krupp plant itself. With the exception of very small blocks, such as the 12x12x14 in. and smaller, nearly all die blocks were cut to length, and many of those made at Ruhrstahl were produced under a bridge type hammer, with jib cranes and tongs used for handling the work.

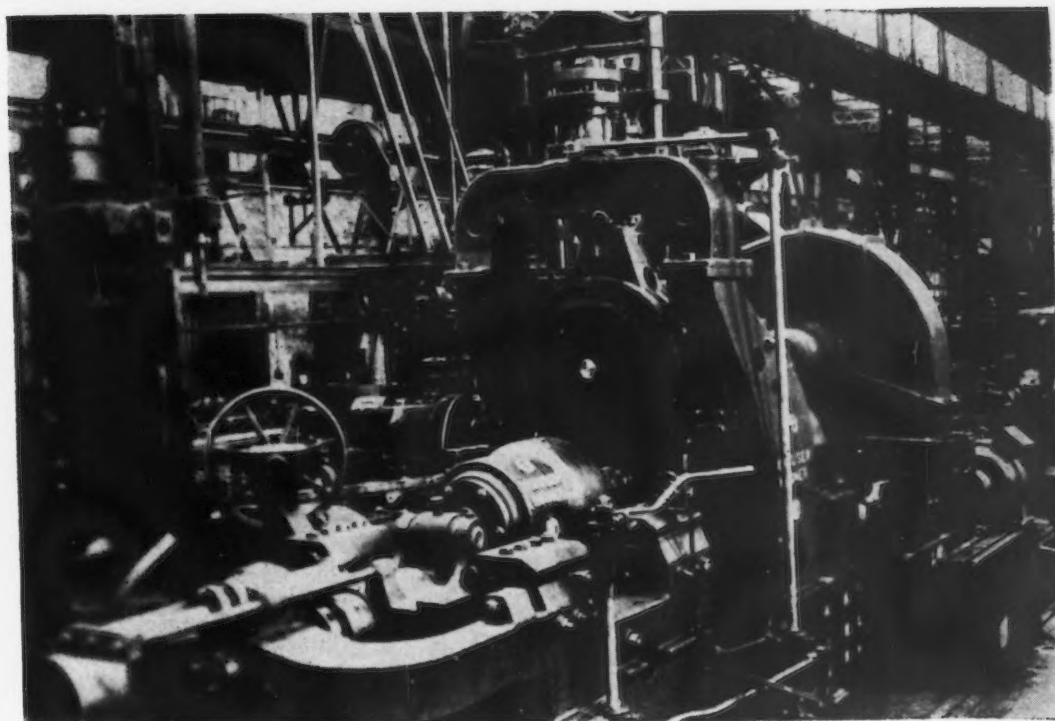
It was evident that the forge heating furnaces were entirely inadequate, and frequently it was only possible to operate a forging unit on one 8-hr shift per day because of the lack of heating facilities. Heat-treating furnaces also were inadequate to keep up with production and many die blocks were cooled in ashes or slag. All the forged blocks were water quenched. Antiquated methods were employed in the handling of the work between the furnaces and the quenching tanks. Some of the blocks were machined on the impression side before quenching and tempering at the Ruhrstahl Annen plant, and round blocks were completely machined with large radii before heat treatment. Machines used for this purpose were old.

The only place where a forging manipulator was

TABLE III
Deutsche Edelstahlwerke Die Block Analysis

Brand	C	Si	Mn	Cr	Ni	Mo	W
AMS	0.55	0.30	0.50 to 0.80	0.60	1.50	0.15 to 0.20	....
AMS	0.55	0.30	0.80	0.75	1.60	0.40 to 0.60	....
Extra							
CMS	0.45	0.35	1.30	1.80 to 2.00	....	0.20 to 0.30	....
CNS T H	0.25 to 0.30	0.30	0.40	1.00 to 1.30	....	0.30 to 0.50	4.50

FIG. 2—Horizontal type of German ring rolling machine, of which only four were produced. They were expensive to build and their output rate was low.



seen which might have been used for die blocks was at Krupp, in Essen. At a single-frame 1000-ton hydraulic press was a forging manipulator manufactured by Firma Dango Dinendall, at Altena, near Iserlohn. This was designed chiefly for forging bars.

Analyses for die blocks produced by Krupp, Ruhrstahl and Deutsche Edelstahlwerke (D.E.W.), at Krefeld, are shown in tables I, II and III.

There was particular interest in observing the German manufacture of races for ball bearings, most of which were produced from tubing, forgings or rolled rings. Manufacturing procedures were similar to those in the United States in the use of tubes and forgings, but German ring rolling machines were appreciably different. These machines, made in the Dortmund plant of Wagner & Co., were of two distinct types: The vertical spindle type shown in fig. 1, of which a considerable number were made, but which had a very narrow range, and the horizontal type, shown in fig. 2. The latter, identified as Model KKRW, was much larger, and was capable of rolling a wider variety of sizes. Only four of them were built, however, of which two were shipped to SKF in Hofors, Sweden, one to Kugelfischer in Schweinfurt, Germany, and one to

Herman Goering Works at Wattenstedt, Germany. Some of these machines differed from the one shown in fig. 2, in that a motor drive was added to rotate the movable adjusting plate. They were both large and expensive, but the production rate per machine was lower than that generally obtained in the United States.

In the preparation of the blanks for ring rolling machines, some difficulty was encountered in obtaining the exact weight required, some of the races having a weight tolerance of ± 1 oz. Rolled bars were sawed to length in many instances. From the sawed blank the production method consists of upsetting, die forming, punching from one side, turning over, and completing the hole by punching from the second side. Most of this work was done on crank presses, but for the larger rings, the forming of the blanks was done on hydraulic presses. For small rings, tubing, forgings made on upsetting machines, or rolled rings were used.

Copies of some German plant plot plans and forge layouts can be obtained from F. E. Hilburn, chief of Metals & Minerals Section, 2097 Commerce Building, Washington.

Tack Welds Prevent Distortion

AN interesting method of preventing distortion during a multiple torch cutting operation has been applied by the Service Welding Co., Ridgefield, N. J., and is shown in this illustration. After the four torches of the 6A Oxygraph have made their cuts in the outer edge of the $\frac{1}{2}$ -in. steel plate, the welder, using an Airco No. 81 electrode, follows along, making tack welds at the points of entry. The plate is thus restored to a continuous strip, and walking or lifting is prevented.



... New Lathe Produces Precision Le

Production of precision leadscrews as long as 15 ft, and with a total lead error not exceeding 0.0075 in. is made possible by a special lathe recently introduced by Monarch. A feature of this machine, described herein, is the Variator, a device which permits selective endwise movement of the machine's own leadscrew to correct lead errors during the final cut.

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By H. E. LINSLEY
Machine Tool Editor

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IT has long been considered axiomatic that no machined part could be more accurate than the machine on which it was produced; yet this old rule has now been upset by the performance of a new leadscrew cutting machine which is capable of turning out finished leadscrews that are more accurate than the leadscrew of the machine itself.

Produced by the Monarch Machine Tool Co., Sidney, Ohio, and based on an earlier machine manufactured for Gould & Eberhart, Irvington, N. J., this special lathe was constructed for the U. S. Navy, and incorporates several entirely new features. It is capable of cutting screws up to 9 in. diam and 15 ft long with a lead error not exceeding 0.0075 in., noncumulative, in 15 ft.

The basic job for which the machine was designed was the chasing of large diameter, coarse pitch screws in nickel molybdenum material, and the great size and accuracy demanded necessitated starting from scratch. Low spindle speeds were required because of the material and the diameter of the work, and it was specified that the operation be completed in one setting. This called for special steady rests which would permit the tool to pass from one end to the other without interference and without changing a steady rest.

These rests, clearly visible in fig. 1, are carried on two tubular supports securely held by four brackets bolted to pads on the rear of the machine. Three rests are provided, and these are adjustable laterally to

any desired position. Bronze faced pads provide three point support while leaving the front of the work open for the tool to pass. The third support point is operated through a hand wheel for close adjustment, and, being mounted on a hinge, may be swung out of the way for loading and unloading. The capacity of the rests is adjustable from 3 to 9 in.

The spindle is of the flanged type and is machined from a one-piece forging of high-grade alloy steel. It is hollow so that, if desired, bar stock may be fed through it, and is mounted on precision antifriction bearings with provision made for wear adjustments. The headstock drive is through a 25 hp, 230 v, 3 to 1 variable speed dc motor, and heavy duty multiple V belts controlled through a large multiple disk clutch. Twenty spindle speeds, ranging from 3 to 80 rpm, are obtained through a worm-driven spindle with the addition of pick-off gears. The spindle is very accurately aligned with the bedways within 0.001 in. up, and 0.0005 in. front and rear on a test bar extending 18 in. from the spindle nose. During the assembly operation, this alignment was checked by taking a cut on the collar of the test bar at the spindle nose, and a similar cut on a collar 18 in. distant from the nose; it was found that the differential in the diameter of the two collars did not exceed 0.001 in.

For driving the work, either a face plate or a 4-jaw chuck may be used, the latter being provided with a special indexing arrangement to be used when chasing multiple start screws. The face plate when mounted on the spindle will run true on the face and periphery within 0.002 in., and work mounted on the plate will run true in diameter and concentricity within 0.0005 in., at a distance of 12 in. from the plate. The chuck will run true on both face and periphery within 0.003 in. A test plate 11 in. in diam mounted on the nose has been found to run concentric within 0.0005 in., and not to cam more than 0.0005 in. at a radius of 5½ in.

Screws are finish turned on the machine prior to thread cutting, and for this purpose a simplified gear box is provided to furnish feeds of 0.005, 0.012, 0.030, and 0.065 in. This gear box drives the apron through a separate feed rod, and not through the master leadscrew. A feed reverse is provided on the apron for either right or left feed, and automatic lubrication is furnished for the apron and carriage ways.

The tailstock is of the set-over type, having a maximum travel to the tailstock spindle of 11 in. The spindle has a built-in antifriction center mounted on precision bearings, and is positioned to the work through a handwheel mounted on its front and operating a rack. A conveyor mechanism is provided on the tailstock for manually positioning it along the bedway. When fully extended the tailstock spindle is in line with the bedways within 0.0005 in., and concentric with the spindle nose within 0.0005 in.

Mounted on the apron is a control lever for mechanically disengaging the main drive clutch located



Leadscrews

at the rear of the headstock, and also a control for the main drive motor. This is of the reversing type with dynamic braking, and allows the operator to start, stop, and reverse the machine at any place along the bedway, and at the same time to select the desired spindle speed through rheostatic control. With control of this electrical equipment on the carriage, the operator is able to select the correct speed for chasing and, by using the high speed of the motor, to return the carriage at a rapid rate to its starting position. The leadscrew reverse is manually operated from the headstock for chasing right or left hand threads, and pick-off gears are provided for chasing single and multiple start threads up to and including a 3-in. lead, either right hand or left hand.

The lathe bed measures 31½-in. wide, and is heavily ribbed for strength. The ways are ground to create extreme accuracy of alignment.

The leadscrew is mounted at the center of the bed and is supported by roller bearings spaced every 2 ft. An oil trough partially surrounds the screw so that this operates continually in an oil bath. Approximately 6 weeks were required to manufacture this screw. After finish turning, the thread was semifinish cut, and then checked for lead error on a special leadscrew checking machine. The screw was then put back into the machine and finish threaded, errors being corrected by means of a specially designed Variator. This latter is an ingenious mechanism whereby the master leadscrew may be moved either to the right or left depending on whether the error is plus or minus.

When the screw is checked in the checking machine, all lead errors are noted on a special paper chart which serves to guide the operator during the final thread cutting. A large drum, visible in fig. 2, is driven directly from the leadscrew and is graduated in inches corresponding to the full length of the screw. In front of this drum is a large handwheel graduated in ten-thousandths of an inch. As the cutting tool progresses along the work, the drum rotates, and by observing the chart the operator can see at what point correction is required. The

proper amount of correction is then applied by moving the handwheel the necessary number of ten-thousandths, thus moving the master leadscrew forward or back and reducing or increasing the depth of cut.

As finally checked before installation in the machine, the master leadscrew was found to have a maximum error of plus 0, minus 0.0036 in., noncumulative, and while this could have been reduced this was not necessary since, by means of the Variator, other screws can be produced from this with even less error. The purpose of the huge leadscrews produced on this machine, and the need for such accuracy has not been disclosed, but it is now in operation at a Navy base and is substantially outperforming its own specifications.

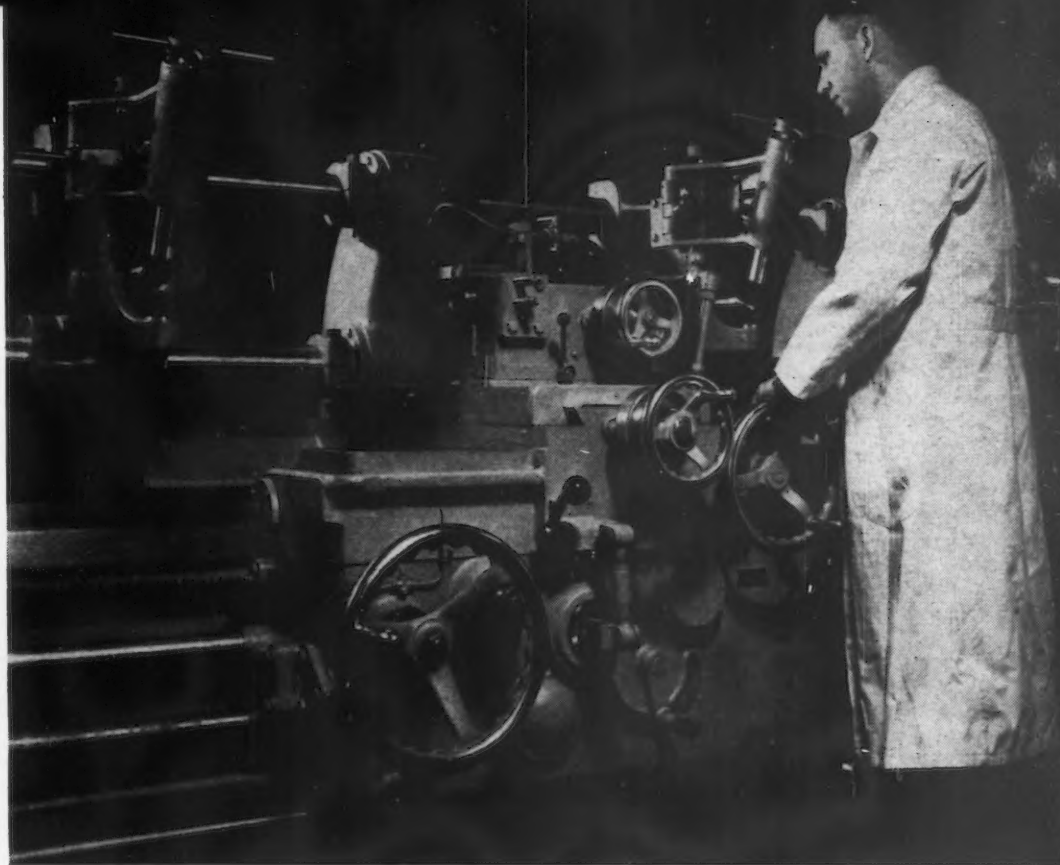


FIG. 1—Close up of the working position on the Monarch leadscrew cutting machine. Workpiece has been removed to show the design of the special steady-rests.

FIG. 2—At the extreme right in this view may be seen the special Variator by means of which the operator can shift the machine's leadscrew to right or left to correct lead errors.



Metallurgical Development of Materials for Turbosuperchargers and

Development of ferrous and nonferrous alloys to meet the severe high temperature service requirements of gas turbine operation is described in this article. Problems of grain size in cast buckets, mass effect of large forgings, effectiveness of inspection methods, center cracks in wheel forgings, conservation of alloys and distortion of magnesium parts, are among the subjects discussed herein.

METALLURGICAL problems involved in the aircraft gas turbine are similar in many respects to those encountered in the turbosupercharger and described previously.¹ Application of many of the materials used in the supercharger was based on favorable experience in the exhaust gas units.

One major difference was size. The most generally used supercharger unit consisted of a wheel of less than 10 in. diam, made from a forging weighing 35 lb.

¹ Development of alloys, ferrous and nonferrous, for use in the turbosupercharger was discussed by the author in the first part of this two-part article published July 25.

The most generally used turbo-jet wheel forging was nearly 30 in. diam and weighed about 400 lb. The supercharger buckets weighed about 0.02 lb while the turbo-jet buckets weighed 0.85 lb. The radial flow impeller was 31 in. diam and weighed 625 lb, as compared with 12½ in. diam and 14 lb for the

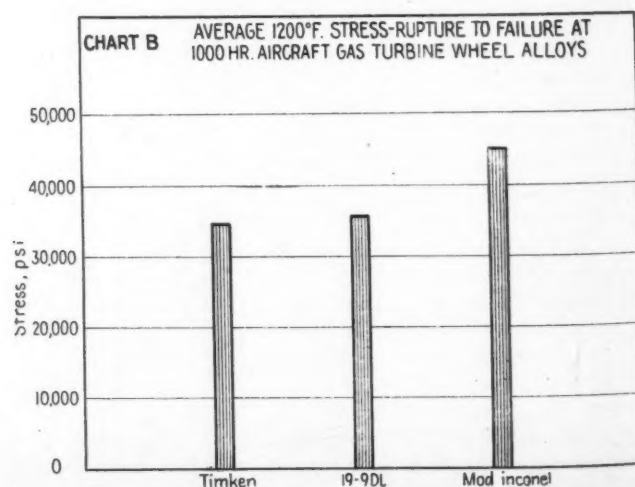
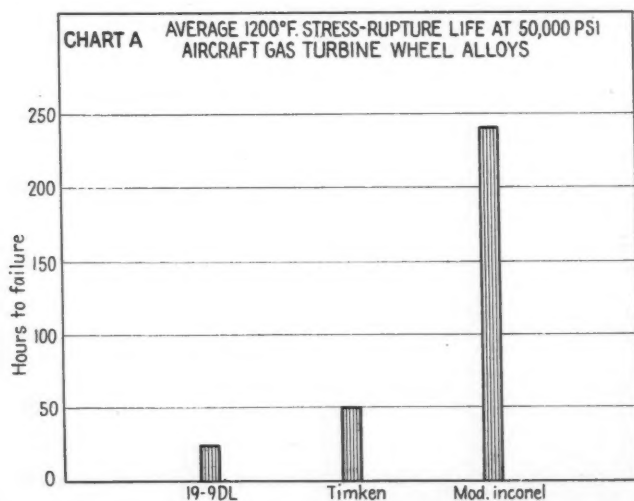
supercharger impeller. Many of the problems encountered were due to this size effect.

The temperature conditions were more favorable in the aircraft gas turbine. Bucket temperatures approximated 1350°F and the operating speeds were somewhat lower, but stresses were higher. The wheel temperatures were at least 100°F lower.

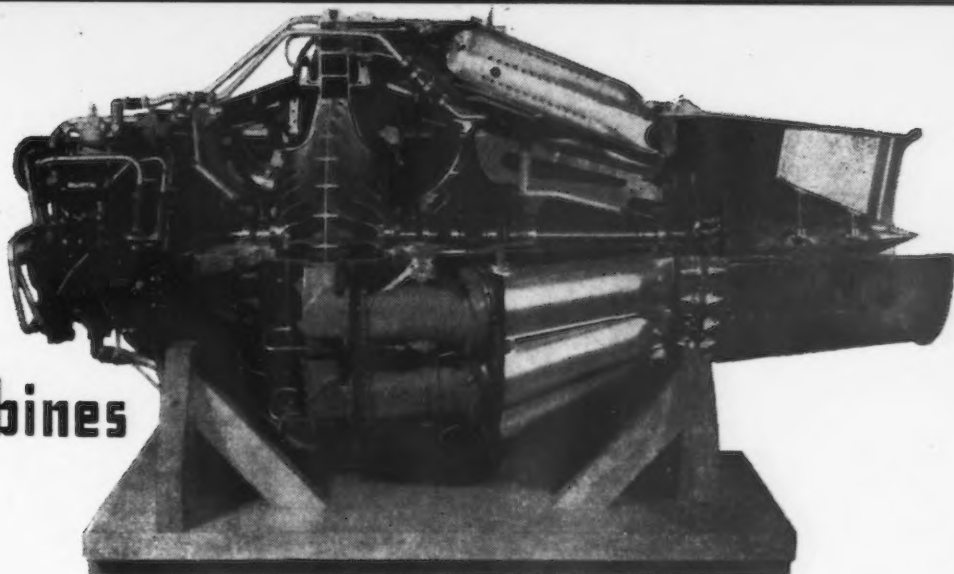
Another major difference was time. The turbosupercharger was developed over a period from 1918 to 1946, or 28 yr. During this period constant changes and improvements were incorporated. The turbo-jet units were designed, manufactured, and improvements incorporated within the past few years, since work began in September 1941, under the pressure of war necessity.

The wheels for the smaller designs of the jet units were made of Timken² alloy, while the largest type was made as a composite, using SAE 4340 for the integral wheel and shaft and Timken alloy for the rim material. Considerable difficulty was encountered in manufacturing the 400-lb wheel forgings. A considerable number of the forgings produced had center cracks or porosity. Some of the faults were due to unsound ingots and some were due to circular cracks in the planes of rotation at the center of the wheel. In order to prevent the use of these defective forgings, each one was X-rayed, Zygloed³ and tested with a supersonic crack detector⁴. It was found that the X ray was effective in locating internal pipe or blowholes, but quite ineffective in detecting fine cracks. The Zyglo was effective in detecting surface imperfec-

FIG. 1—Chart D (right) gives typical stress rupture values at 1200°F the same alloys in stress-rupture at 1200°F under stress of 50,000 psi. Chart C gives average stress-rupture



Aircraft Gas Turbines



Cutaway view of G-E aircraft gas turbine.

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tions. The supersonic test was effectively used in detecting cracks or voids too small to be found by X ray. The supersonic method is accurate (within

² See "16-25-6 Alloy for Gas Turbines," THE IRON AGE, Jan. 17 and 24, 1946.

³ The Zygo method of detecting surface flaws was discussed in THE IRON AGE, Dec. 17, 1942, p 56.

⁴ See "Supersonic Testing in a Steel Plant," THE IRON AGE, Jan. 31, 1946, p 38; also "Ultrasonics—a New Metallurgical Tool," THE IRON AGE, May 15, 1941, p 48.

about 1/4 in.) in determining the location of voids and cracks undetectable by X ray or Zygo methods.

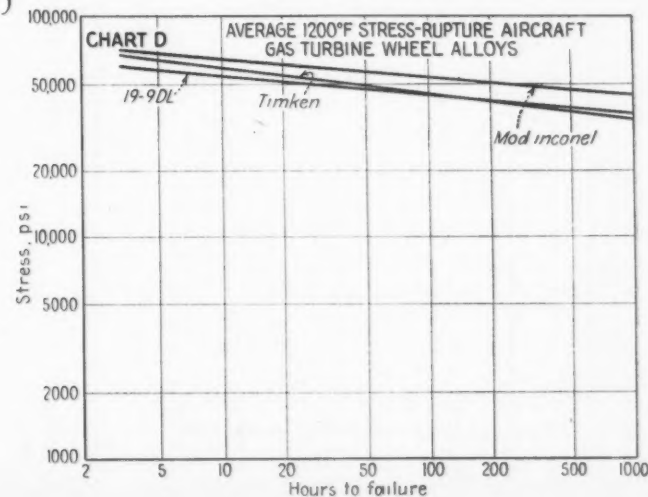
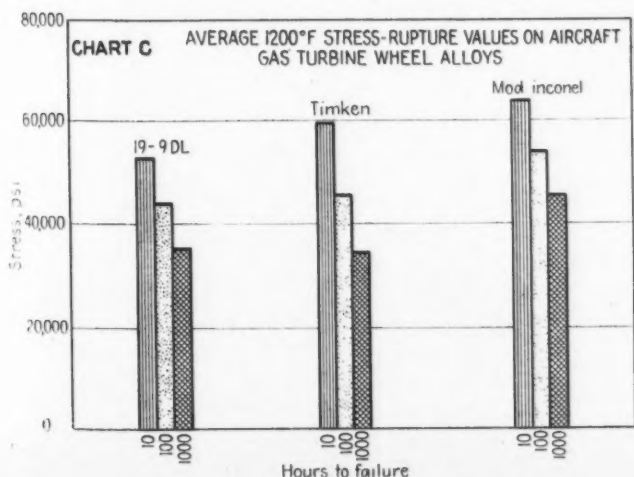
During the later stages of the war, the wheel manufacturers made great strides in eliminating faulty wheels. This improvement was imperative from the point of view of strategic materials and of available forging capacity, since the major alloys—nickel and chromium—were becoming increasingly scarce. A substantial number (approximately 150) wheels, weighing about 400 lb, were burst in a vacuum test to

determine the relative quality of various manufacturers' wheels, various heat treatments and to evaluate the X ray, Zygo and supersonic defects.

Correlation was attempted between the vendors, methods of manufacture, types of defects found in inspection, and with subsequent cut-up tests of burst wheels. It was determined that the defects found by Zygo had the greatest adverse effect on bursting speed. This is probably due to the fact that surface defects were greater "stress raisers" than the internal defects detected by supersonic or X ray. It is possible, however, that internal defects would have greater effect on wheel failures under service conditions where varying stresses of operation, together with stresses caused by heating and cooling, could cause a slow fatigue type progression of internal cracks.

It was also found that ductility in the center of the wheel, as indicated by short time tensile tests, had considerable effect on the bursting speed. Experiments were carried out on various ingot sizes, as well as in increasing the amount of upset, decreasing the amount of pipe segregation and grain flow by upsetting directly from a formed ingot, and several other methods. The final results of these experiments resulted in narrowing the average bursting-speed range substantially, and raising the minimum bursting speed

for several turbine wheel materials. Chart A (left) shows the life of Chart B shows the stress at 1200°F resulting in failure in 1000 hr, while values at 1200°F for these wheel alloys.



about 70 pct, using the same chemical composition.

Varying hardnesses have been applied to different designs. It has been found that certain designs require some degree of hot-cold work (1200° to 1350°F) to raise the yield strength to a satisfactory figure. Other designs have made use of annealed material where maximum ductility is obtained. The consensus of opinion at the present time is that a certain minimum ductility is necessary for the wheels to guard against small defects acting as stress raisers and that operational stresses at the center must not exceed the yield strength of the material.

Wheel forgings of 8 or 10 other compositions were forged and tested, but the average bursting speed and the range of bursting speeds of these other wheel materials were not substantially better than that of the best practice developed by Midvale on Timken alloy. Many of these other materials contained greater

material. The welded area is checked by Zyglo, supersonic methods, or both, to determine the quality of the weld.

The composite wheel was conceived as a means of avoiding the "size effect" in large forgings. It involved the manufacture of an integral SAE 4340 wheel and shaft which was welded with 29 pct Cr - 9 pct Ni weld wire to a Timken alloy ring. The ring was subsequently welded with 19-9 WMo weld wire to the S-816 buckets used on this assembly. This fabricated assembly did away to a substantial degree with the "size effect" problems involved in a large wheel assembly. Fig. 1 gives stress rupture values at 1200°F of various turbine wheel materials. It should be borne in mind that selection of material for a specific design may be influenced by strategic alloys, weldability, forgeability, rupture or creep properties.

The buckets for the smaller units were of Hastelloy B and Vitallium. These materials were used because of our previous experience in turbo-superchargers. Little difficulty was encountered in Hastelloy B, although this material has low oxidation resistance and its density is substantially higher than other bucket materials.

Vitallium proved to be substantially more of a problem than in the turbos. The comparatively large size of the buckets resulted, when made by the lost wax process, in enormous grain size, as illustrated in fig. 2, some chrome oxide inclusions and subsequent fatigue-type

FIG. 2—Variation in grain size due to mass of bucket in parts cast by the lost wax process. Buckets are shown full size.



quantities of strategic alloys and were substantially more expensive than Timken wheels. Many of these materials were less machinable than Timken alloy, and since this is a serious problem in broaching the pine tree dovetails for the buckets, production would have been delayed by their use.

The Timken alloy wheel was flash welded to the SAE 4140 shaft by a special technique minimizing the softened zone (affected area) in the heat treated shaft material. Strain relief anneals after welding are below the tempering temperature for the shaft

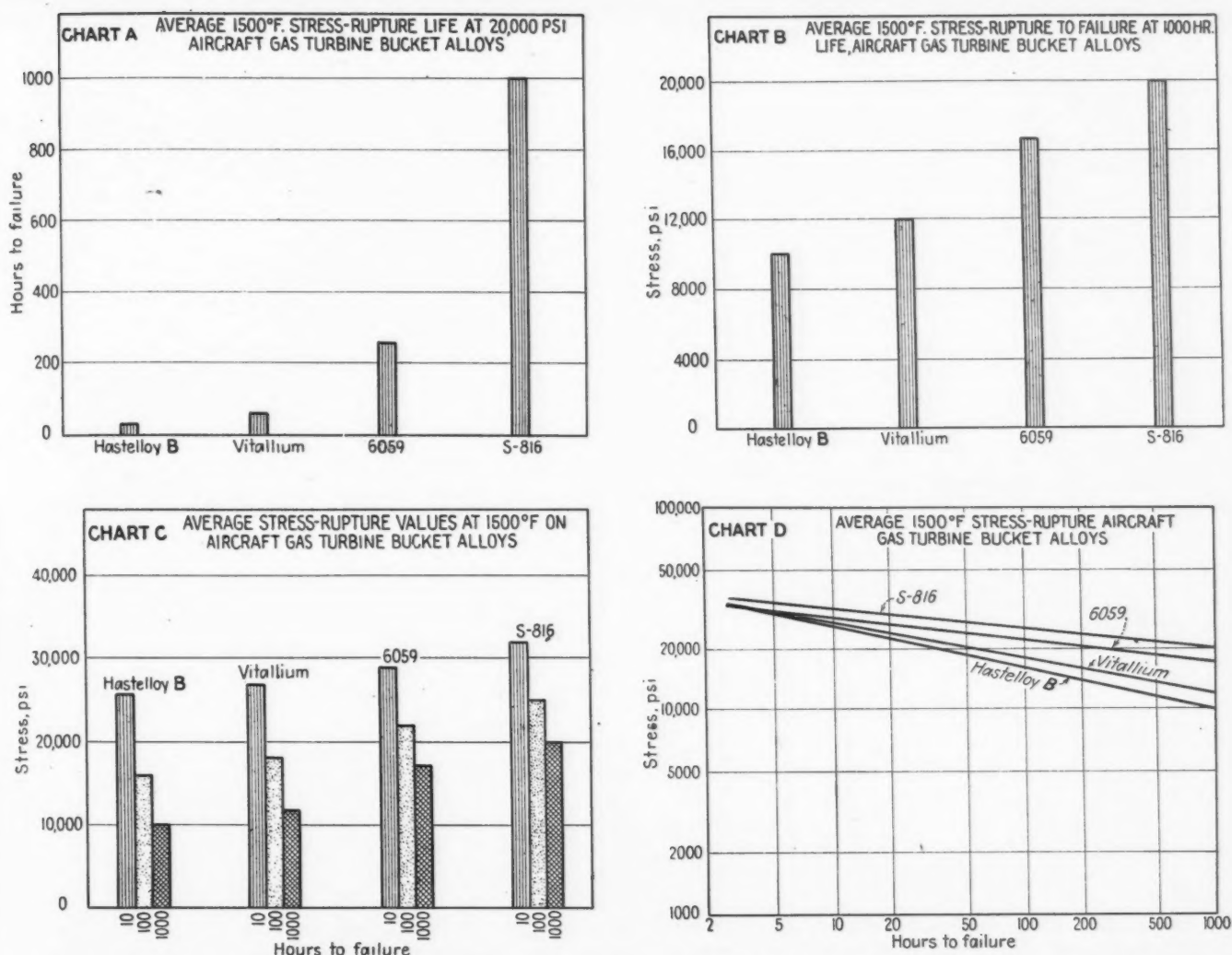


FIG. 3—Chart D (bottom right) shows typical stress rupture values at 1500°F for several turbine bucket alloys. Chart A (top left) gives stress-rupture life of these alloys at 1500°F under a stress of 20,000 psi. Chart B illustrates stress at 1500°F resulting in failure in 1000 hr, while chart C gives average stress-rupture values at 1500°F of typical bucket alloys.

failures in isolated cases on endurance tests. Considerable improvement has since been made by cast bucket manufacturers in furnishing buckets with controlled or guaranteed grain size and in limiting presence of chrome oxide.

Substantial effort has been made to correlate failures with laboratory tests, such as rupture, damping, fatigue, etc. It seems probable that the particular design and operating conditions influence the nature of failure. In the turbosupercharger the temperature was higher, allowing rapid recrystallization and consequent relief of internal strain. These buckets were more effectively damped than the aircraft gas turbine buckets, since at the temperature of operation the bucket bands touched and in some cases were upset by expansion. Some of the aircraft gas turbine buckets were designed without this damping effect and operated at temperatures low enough to minimize recrystallization and strain relief. In this type of bucket there was some degree of correlation between the failure in test and the high temperature fatigue strength, while in the supercharger buckets, rupture strength was the best criterion of performance. The temperature of operation is sufficiently low in these gas turbine installations to reduce to a minimum corrosion and oxidation in the buckets.

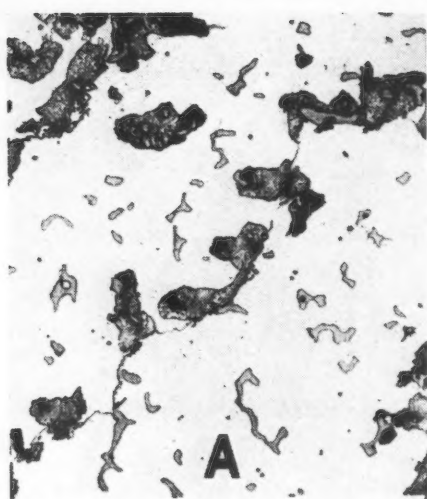
The damping capacity of a bucket material as a modifying factor for interpreting endurance strength

should affect time to failure in this type of design, but very poor correlation has been obtained to date. This may be due to the damping effect of the "pine tree" dovetail which overshadows the damping properties of the material.

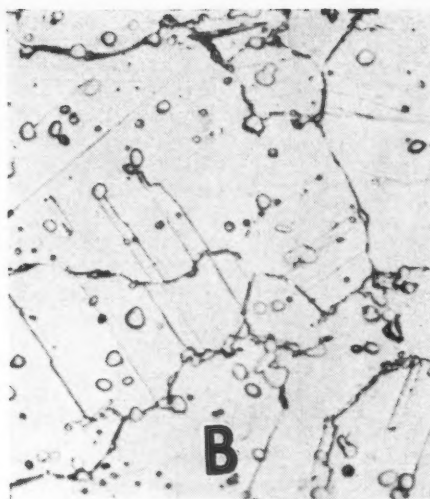
Some of the forged and heat treated buckets have shown a differential grain growth condition similar in characteristics to "Steads brittleness" in low carbon steel. This condition is felt to be due to a critical amount of hot-cold work at the finishing operation in forging. The subsequent anneal causes the grains in certain areas to enlarge substantially, while other adjacent grains remain small. This condition is avoided by keeping the finishing forge temperature high and the annealing temperature low.

The heat treatment of the buckets varies in each material. Hastelloy B is spheroidized at temperatures between 1700° and 1900°F to minimize the loss in ductility under operating conditions due to precipitation hardening. Vitallium has been used as cast in certain installations and solution-treated in others in order to obtain properties suitable for the application. S-816 has been solution treated to improve the rupture strength over that obtained in the as-forged or strain-annealed condition. The use of extremely high solution treatments are avoided due to low ductility resulting in erratic properties.

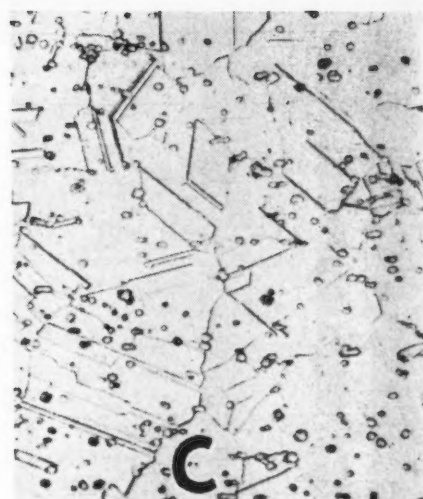
Fig. 3 shows typical stress rupture values at 1500°F



Cast Vitallium bucket with typical eutectic structure at grain boundaries. Etch: 3 pct HCl, electrolytic—100X.



Hastelloy bucket, spheroidized 24 hr at 1000°F, showing representative angular grains with twinning present. Etch: FeCl₂—500X.



Forged S-816 material, solution treated at 2300°F, water quench, and aged at 1400°F. Etch: glyceregia—500X.

Fig. 4—Typical microstructures of several bucket alloys.

of turbine bucket materials. Here not only the stress rupture properties must be considered in selecting an alloy for a special design, but also the fatigue strength, damping properties, forgeability, casting properties, oxidation and corrosion resistance, soundness, freedom from chrome oxide inclusions and freedom from excessive grain growth. Microstructures of several bucket alloys are illustrated in fig. 4.

Sheet metal parts, except for liners, are made from type 347 (see fig. 5) stainless welded with wire of the same composition. The fabricated diaphragms in most units have been made with the same material, although 25-20 has been used for blades in one unit. The performance of the sheet metal parts has been very satisfactory. Occasionally a crack has appeared in the diaphragm after substantial service, but no failures affecting operation have occurred. The satisfactory performance of type 347 in these units is probably due to the slightly lower temperature as compared with the turbos. For strategic reasons, type 321 was to be substituted prior to V-J Day. No substantial operational tests have been made on this alloy, however. The diaphragm assemblies were made up with drop forged blades welded to a punched inner and

outer ring assembly. Great care was taken to insure a columbium content at least eight times carbon content to guard against intergranular corrosion.

The liners (the sheet metal in the combustion chamber directing the flow and distribution of combustion gases) proved to be a major problem in one unit. Extensive tests were made of about 40 materials, both in the laboratory and in the installation. Since some of these units were forced to use high-octane gasoline, the corrosion of the tetraethyl decomposition products, lead bromide and lead oxide, was very severe. The materials finally selected for production were Inconel and 25-20 with 2 pct Si. In other designs, more effective and more uniform cooling of the liners prevented substantial trouble. The lesson that was learned from this experience was that uniform heating, cooling or operating conditions were quite as effective as the extensive use of strategic alloys in licking difficult problems. Other materials used in the aircraft gas turbine are conventional types, such as SAE 4140, 52100, etc.

When the war ended, extensive experimental programs were underway to reduce the tonnage of nickel, chromium, columbium, vanadium and other strategic alloys being used. In the projected program it could be foreseen that more columbium would be required than was available in the world; the use of other alloys was exceeding production of them. This experience also taught a valuable lesson, in that in designing an installation for quantity production, the availability of the metals required for the projected maximum production must be carefully studied. It is easier to make changes before large production is underway than after the production men take over.

The chemical composition of the "heavy" materials used in aircraft gas turbines is given in table I.

The radial flow type of jet engine had a double-inlet impeller machined from a 25-ST aluminum alloy forging. Microstructure of 25-ST impeller wheels is shown in fig. 6. The weights of these forgings before being machined were from 250 lb for the smallest unit to more than 900 lb for the largest. When we consider that the peripheral speed of the highest production impeller during normal operation was approximately one and one-half times the speed of sound, it becomes readily apparent that perfection was a neces-

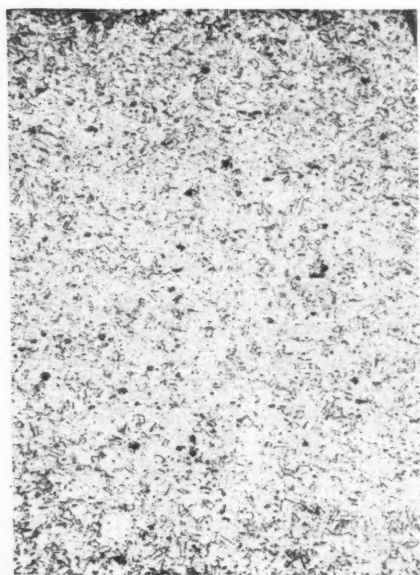


FIG. 5—Type 347 (KA:SCb) sheet stock in annealed condition, used in turbine construction. Illustration is an edgewise micro. Etch: 10 pct oxalic acid, electrolytic—100X.

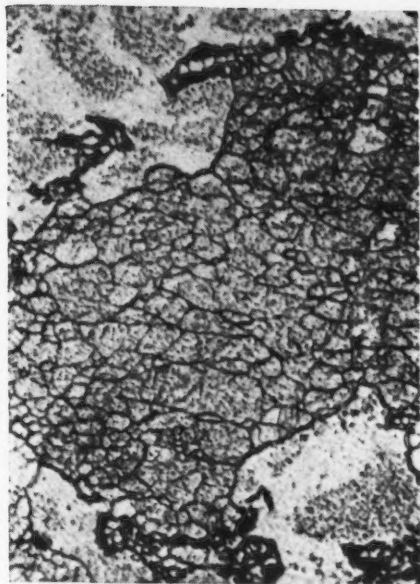


FIG. 6—Impeller wheel forging of 25-ST aluminum alloy, solution-treated at 960°F, aged at 320°F. Etch: Keller's—500X.

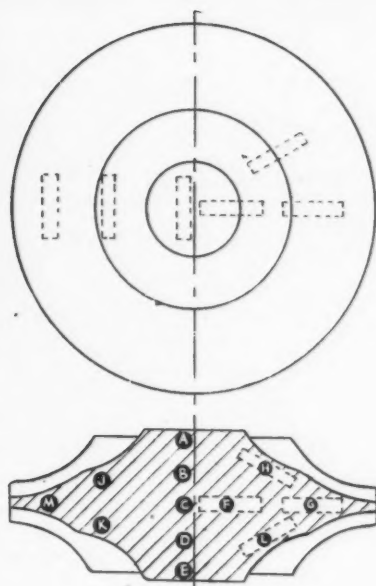


FIG. 7—Mechanical properties of a typical radial flow impeller forging of 25-ST alloy.

Ser. No.	Yield Strength (0.2 pct)	Tensile Strength Psi	Elong. in 2 in.
A	39,900	52,500	6.5
B	39,000	53,500	12.5
C	36,700	54,000	13.0
D	36,500	52,500	9.5
E	41,250	50,820	5.0
F	36,500	54,000	13.5
G	38,600	56,500	12.5
H	34,200	50,500	7.5
J	40,900	57,500	15.5
K	39,250	58,000	11.5
L	34,000	51,300	8.9
M	40,500	58,000	15.9

sity. Completely breaking up the cast billet structure, eliminating discontinuities and dross inclusions, controlling the grain size and direction, as well as obtaining high mechanical properties uniformly distributed throughout the forging, were some of the serious problems which had to be quickly overcome.

A complete mechanical property exploration was made from one forging from each lot to insure such uniformity and the values shown in fig. 7, a random lot of forgings, are given to illustrate the successful completion of this difficult assignment.

The compressor casings, diffusers, truss rings, as well as most of the accessory castings, such as gear casings, bearing housings, etc. were made from cast magnesium alloys, C and H (AM-260 and 265). Originally all of the magnesium alloy castings were specified in the heat treated and aged condition (HT-A), but distortion on life tests from high temperatures on some of the parts led to the introduction of solution treatment, followed by a stabilizing treatment at 500°F (HT-S) which appeared to alleviate such troubles. A typical microstructure of Dow-metal C (HT-S) is shown in fig. 8.

The air adapters which conduct the compressed air

to the combustion chambers were made from aluminum alloy 355-T-51, since the temperatures were considered to be too high for magnesium and since alloy 355 had proved satisfactory in similar operations. Oil deflectors were made from aluminum alloy X-750 because of its non-scoring properties.

The axial-flow jet engine employed an 11-stage compressor unit with the successive stages becoming progressively larger. The wheels of the first 10 stages were machined from heavy plate stock (2 3/8 in. to 3 1/8 in. thick) of aluminum alloy 24-ST, while the wheel of the last stage was type 410 stainless because of the higher temperatures to be encountered. Type 410 stainless steel blades were dovetailed into all wheels, both aluminum and stainless. When production would become sufficiently high to justify the die cost, forged wheels were contemplated from aluminum alloy 14-ST instead of machining from 24-ST plate stock. Considerable trouble was encountered from distortion on machining these wheels. A stabilizing treatment has been the most effective remedy. Wheel spacer rings have been made from both 24-ST plate stock and forged 14-ST.

The compressor assembly castings, such as the com-

TABLE I
Chemical Compositions of Heavy Materials Used in Aircraft Gas Turbines

	C	Mn	Si	Cr	Ni	Co	W	Mo	Cb	V	N ₂	Fe	Cu	Ti
Hastelloy B	0.07	0.75	0.75	.....	65.0	.....	.....	28.0	.....	0.35	.....	6.0	.....	.....
Vitalium	0.25	0.60	0.60	27.0	2.0	Bal	.....	5.0	.....	.....	.....	1.0	.....	.....
6059	0.40	0.60	0.60	23.0	32.0	Bal	.....	5.0	.....	.....	.....	.....	.....	.....
S-816	0.40	0.75	0.75	20.0	20.0	42.0	4.0	4.0	4.0	.....	.....	4.0	.....	.....
Timken	0.10	1.00	0.75	16.0	25.0	.....	.....	6.0	.....	.....	0.15	Bal	.....	.....
19-9-DL	0.30	1.00	0.60	19.0	9.0	.....	1.0	1.0	0.30	.....	.....	Bal	.....	0.30
KA-SMo	0.08	1.75	0.50	18.0	13.0	.....	.....	2.5	.....	.....	.....	Bal	.....	.....
KA-SCb	0.10	1.50	0.75	18.0	10.0	.....	.....	.....	0.80	.....	.....	Bal	.....	.....
25-20 + 2Si	0.10	0.50	2.00	25.0	20.0	.....	.....	.....	.....	.....	.....	Bal	.....	.....
Inconel	0.15	0.75	0.25	13.0	76.0	.....	.....	.....	.....	.....	.....	8.0	0.30	.....
Mod. Inconel	0.10	0.60	0.60	15.0	74.0	.....	.....	.....	Al 0.70	.....	.....	6.0	0.10	2.5
25-20	0.08	1.25	0.50	25.0	20.0	.....	.....	.....	.....	.....	.....	Bal	.....	.....
25-20 (cast)	0.18	1.50	1.50	25.0	20.0	.....	.....	.....	.....	.....	.....	Bal	.....	.....
Type 410	0.10	0.50	0.50	12.0	0.5	.....	.....	.....	.....	.....	.....	Bal	.....	.....
19-9 WMo (weld wire)	0.10	1.50	0.75	19.0	9.0	.....	1.50	0.50	1.00	.....	.....	Bal	.....	0.10
SAE 4340	0.40	0.70	0.28	0.80	1.85	.....	.....	0.25	.....	.....	.....	Bal	.....	.....
SAE 4140	0.40	0.87	0.28	0.95	.....	.....	.....	0.20	.....	.....	.....	Bal	.....	.....



FIG. 8—Dowmetal C (HT-S) used for casings, diffusers and accessory castings. Alloy shown is solution treated at 765°F followed by a stabilizing treatment at 500°F. Etch: glycol—500X.

pressor casing, midframe and forward frame, as well as the most of the accessory castings, were made from aluminum alloy 356-T6. Stabilization has again been employed to alleviate distortion. The oil defectors in this type of jet engine are also made from the X-750 aluminum bearing alloy, this material having proved by many tests to be superior to other aluminum alloys for the intended purpose. Table II gives the chemical composition of the light metals which were not included in table I.

TABLE II
Chemical Composition of Light Metals Used in Aircraft Gas Turbines

	24-ST	356	X-750	C	H
Aluminum.....	Balance	Balance	Balance	9.0	6.
Magnesium....	6.5	0.3	...	Balance	Balance
Copper.....	4.5	...	1.0	...	...
Manganese....	0.6	...	...	0.15	0.20
Silicon.....	...	7.0	...	...	...
Tin.....	...	...	6.0	...	...
Nickel.....	...	...	1.0	...	...
Zinc.....	...	...	...	2.0	3.0

A cyclic accelerated life test for aircraft gas turbine units was adopted incorporating short periods at operating temperature at various speeds, followed by shut down. It is felt that intermittent service of this sort simulates service conditions more accurately than steady operation and will result in more rapid failure, for evaluation, of highly stressed parts. The cycle used involves operation at the anticipated temperature for 5 min at low speed and 15 min at high speed. This cycle is repeated three times, followed by a shut down for 15 min, after which the entire operation is repeated.

All chemical, physical and rupture properties that have been given are approximate average properties. The values given are not minimum values, and are based on a limited number of tests. They should not be used in design without suitable allowance for spread in performance, a matter which has not been discussed in this article.

German Beryllium Production and Uses

THE "Extraction and Uses of Beryllium in Germany" is discussed by G. T. Motock in the Bureau of Mines Information Circular 7357, based on visits made to various German plants.

Beryllium metal is used in metallurgy as a scavenger, an alloying element, or as the pure metal, for certain parts. Beryllium oxide is used in ceramics and as a high-temperature refractory. A sintered beryllium oxide, "Degussit," said to be gas-tight, has been developed by the Germans.

Copper-beryllium master alloys were made at one plant, Heraeus Vacuumschmelze, Hanau, by reducing beryllium oxide with graphite in the presence of copper powder or copper oxide. The copper powder is placed on the bottom of a 3-phase electric arc furnace, and a mixture of beryllium oxide, graphite and copper oxide is added in small lots. This makes a copper-beryllium alloying containing 3 to 4 pct Be. There is a loss of 20 pct of the added beryllium. A charge of about 400 lb at a furnace temperature of 3632°F takes 5 hr. During cooling, the graphite comes out of the melt, and the slag is composed of carbon and beryllium carbide. The slag is reused for the succeeding charge.

The same plant reports the development of beryl-

lium alloys for watch and clock springs and for instruments that surpass in accuracy and performance those made of other alloys. Two main types of alloys for watch springs are: (1) Contracid, containing 60 Ni, 15 Cr, 7 Mo, 15 Fe, 2 Mn, 0.5 Si, and 0.5 to 0.75 Be, and (2) Nivarox, consisting of four groups of alloys:

Composition	Group			
	CT	M	N	W
Ni	37.0	31.5	36.0	30.0
Cr	8.0	....	....	....
Fe	54.0	60.0	60.0	61.0
Mn	0.85	0.75	0.80	0.70
Be	0.90	0.90	0.90	0.90
W	....	....	....	7.5
Mo	....	6.50	....	....
Si	0.2	0.10	0.10	0.10
Ti	1.0	....	2.0	....
C	Less	than	0.10	....

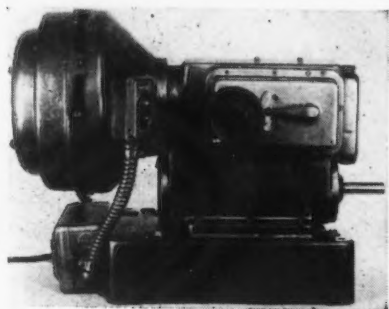
A steel containing beryllium (German patent 691,325) has been developed, but was not made in large quantities due to the shortage of beryllium. Another German patent, No. 654,829, describes a hard alloy for tools, shells, and bearings and consists of 7 pct Be and 0.50 pct C, with tungsten, molybdenum and chromium.

New Equipment . . .

Power Transmission

Variable speed transmissions, motor generators, low inertia motors, starters and remote control units are described in the following pages, together with switches of various types. A special coupling, universal joint, and several hydraulic units are also included in the review.

THE hydraulic variable speed transmission with an integrally mounted air-gap type electric drive motor, illustrated, has been manufactured by the *Portman Machine*



Tool Co., 70 Portman Rd., New Rochelle, N. Y. This Model HT2 transmission is available in 2, 3, and 5 hp size ratings. Infinitely variable speeds throughout the entire speed range from zero to neutral, to full drive motor speed, 1140 or 1725 rpm, both forward and reverse, are said to be instantly available. In addition, the transmission provides starting torque at all times for heavy load starting. Various types of controls other than the handwheel shown, can be furnished.

Hydraulic Cylinders

A COMPLETE line of nonrotating, hydraulic cylinders, offered by *Anker-Holth Mfg. Co.*,

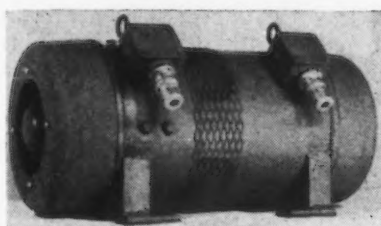


Port Huron, Mich., features absence of tie rods; cushioned cylinders at no increase in overall length; two-way action; and one-piece, step-seal piston rings. Cyl-

inders are designed for low pressures up to 750 psi and high pressures from 750 to 2000 psi and are available in sizes ranging from 1½ to 8-in. bore. Seven standard mountings are available: Foot, trunion, center line, clevis, flange with rod or blind end, and adapter. Any length of stroke can be furnished with standard rod, oversize rod or double end rod.

Motor-Generator Set

DEVELOPMENT of a compact high frequency motor-generator set which produces 1000 volt-amp at 115 v ac has been completed by the *Kato Engineering Co.*, Man-

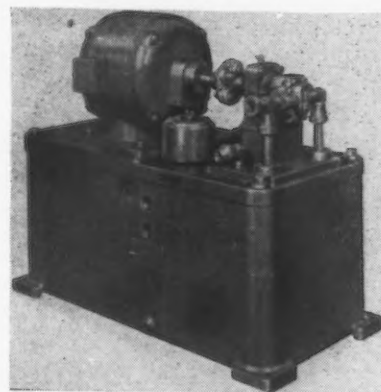


kato, Minn. The unit is of all-steel construction and designed to operate from 75 v dc. Voltage regulation is approximately 10 pct at 60 pct P.F. and 7 pct at unity power factor. It is a four-pole unit, rated at 3440 rpm, designed for continuous operation and especially suitable for railway locomotive use.

Hydraulic Units

DESIGNED for application on light duty machines, a compact pumping unit has been announced by the *John S. Barnes Corp.*, Rockford, Ill. This unit, Model F-10-A, illustrated, is furnished with gear pump, overload value motor coupling, pressure gage, and miscellaneous parts, less the motor. Pump delivery is rated at 5 gpm. It can be mounted in the machine or on a separate base.

For jobs which require 2 and 5 hp, Model F-20-A hydraulic unit has been developed. A Barnes roto-



blade pump which is direct driven by motor, develops fluid power. Maximum pump delivery is 12½ gpm for motor speeds of 1200 or 1800 rpm.

Low Inertia Motor

DESIGNATED as Model 2A Servo-Motor, a compact, low inertia motor, 60 cycle, 2 phase, for remote control applications, has

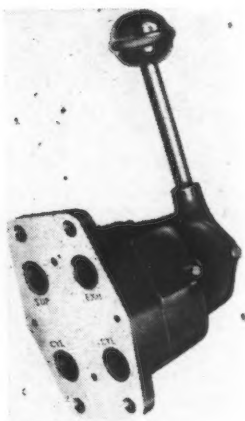


been developed by *Transicoil Corp.*, 114 Worth St., New York. The unit does not run single phase and the fixed phase may be continuously energized. It can be wound to operate from 10 to 80 v. Impedance is practically constant from full speed to stall and the standard stall torque, 1½ oz-in. can be changed as required. The Servo-Motor, which is furnished with separate

leads for each phase, is a midget size unit that fits inside the hand.

Four-Way Valve

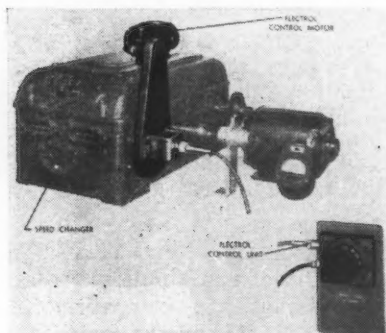
ADDED to a line of operating valves for compressed air, manufactured by *Numatics*, Milford, Mich., is a four-way hand-



controlled model. It is full-ported poppet type, having only two poppets. All ports are on one face with both outlet connections at one end to facilitate piping. There are no stuffing boxes or springs. The installation of the valves can be made permanent, since all the working parts are contained in the upper housing. Identified as the H-4 series, these valves are available in six pipe sizes from 1/4 to 1 1/4 in., locking or nonlocking.

Remote Control

APPLIED to commercial speed changers, *Flectrol*, manufactured by the *Yardeny Laboratories, Inc.*, 105 Chambers St., New York 7, provides fingertip remote control of speed. The dial can be set instantaneously to any desired speed



and the speed changer will follow as fast as the electric servo motor can drive the speed adjusting screw. Exact speed setting is possible and *Flectrol* is said to give precise indication of the speed to the operator.

The dial can be calibrated in rpm, fpm, gph, etc. Any speed within the range of the changer can be selected with an accuracy of better than 2 pct, it is claimed. The remote control is simple, rugged, and compact; it is applicable to new or existing equipment of any type. The illustration shows the *Flectrol* applied to a *Reeves* speed changer.

Magnetic Motor Starters

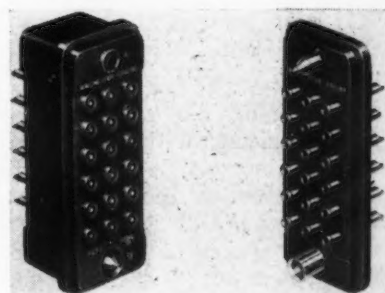
ADDITION of Size 3 magnetic motor starters and contactors has been made to the line of Noark motor starters manufactured by the *Federal Electric Products Co.*, Hartford, Conn. The Size 3 starters and contactors follow the same general design as the Sizes 00, 0, 1 and 2. Because of the increased size and certain larger and heavier parts, minor constructional changes have been made. Double break pure silver contacts eliminate all pigtailed and flexible jumpers. Heavy arc barriers, strategically located to secure mechanical strength, provide high arc rupturing ability. The straight line vertical operation with only one moving part, guided by the Noark ball bearing feature, reduces friction to a minimum. Each pole of the stationary contact assembly is separately encased in its own sealed arc chamber. The movable contacts are mounted on individual mold blocks and are readily removable for inspection and replacement. All wire connection terminals are of the solderless pressure type.

Dual Power Supply

TWO independent, regulated power sources are combined in the CML 1115 dual power supply developed by *Communication Measurements Laboratory*, 120 Greenwich St., New York 8. The B supply furnishes a continuously variable dc voltage from 180 to 300 v, at 70 ma, with a maximum ripple of less than 25 MV. A continuously variable dc voltage from 0 to 75 v with less than 7 MV ripple is furnished by the C supply. Panel controls are provided to adjust the output voltage throughout the ranges indicated. Independent insulated panel connectors are provided for the high voltage terminals. Panel binding posts are supplied for connection to a 6.3-v, 2-amp, unregulated ac filament supply. An ac power switch and pilot light are also mounted on the front panel.

Multiple Contact Connector

DEVELOPED by the *Winchester Co.*, 6 East 46th St., New York 17, a self-separating connector, called a multiple contact connector, incorporates a wiping action plus spring loaded contacts said to make either contact or separation smooth and instantaneous. Molded of Melamine plastic, the one-piece inserts reduce the



danger of flashover due to moisture and dust accumulations, it is claimed. Multiple telescoping barriers serve to isolate contacts and increase both surface creepage and air gap between adjacent contacts. The unit is available in two sizes, 18 contacts and 12 contacts.

Hydraulic Remote Control

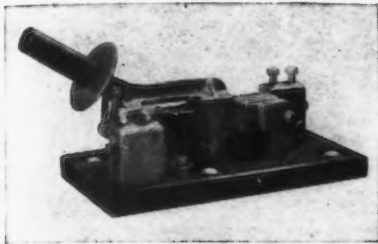
AMINIATURE hydraulic remote control, consisting of two units, a transmitter and a receiver, and weighing 3.7 lb, has been developed by *Sperry Products, Inc.*, 1505 Willow Ave., Hoboken, N. J., for throttle, mixture, governor, or position indicator control. A single

flexible copper tube is used, the system is completely enclosed, and the installation is accomplished with three small bolts for each of the two pieces. Any motion of the transmitter arm is duplicated by the receiver arm, either arm moving through an arc of 60°. The receiver arm may be drilled at any location to obtain the desired linear travel of the actuating rod.



Power-Feeder Switch

A MULTIPLE blade power-feeder switch, with two coil springs attached to the handle for quick circuit break, has been placed on the market by *Mosebach Electric & Supply Co.*, 1111 Arlington Ave., Pittsburgh 3. The quick break feature is said to instantly snuff the



arc and prevent burning the switch. Designed for use in mine trolley and feeder circuits where a wide break is desired, the switch is capable of carrying up to 1600 amp in the four-blade size, illustrated, 1200 amp in the three-blade size, and 800 in the two-blade model. Blades and jaws are made from cold-rolled copper. These switches, available for rib or wall mounting, are of the front connected nonfuse single pole type, equipped with clamps to hold all sizes of cable from 500,000 to 1,000,000 C.M.

Precision Snap Switch

DESCRIBED as a self-contained mechanism for making or breaking a circuit, in small space, with short movement and light pressure, a precision snap switch has been announced by the Industrial Controller Div. of the *Square*



D Co., 4041 N. Richards St., Milwaukee 12. Although small in size, approximately $2\frac{1}{2} \times 1 \times \frac{7}{8}$ in., the switch features strong construction, unusual mounting convenience and 550-v ratings, all of which widen its range of application.

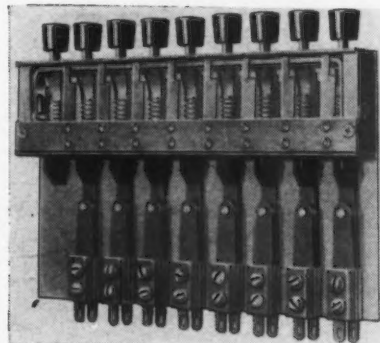
Switchbreaker

MANUFACTURED by the *Code Electric Products Corp.*, 1512 Fox Bldg., Philadelphia 3, the Lewis switchbreaker is a nonfuse, safety type switch. The only controlling

part is a manually operated handle on the right of the box, which shuts off current when pulled down, turns current on when the handle is pushed upward. The switch will automatically drop to the off or down position, should a short circuit or an abnormal overload occur on the circuit controlled by this switch. Should the switch be turned to the on position prior to removing the trouble, it will automatically trip itself inside the box, dropping to the off position as soon as the handle is released. This assures a fool-proof switch. At no time is it necessary to open the lid of the box, since all control is governed by this handle on the outside.

Nine-Position Switch

DESIGNED especially for use on electronic and communications equipment, a nine-position push button switch made in both locking and nonlocking frame types has been announced by *General Control Co.*, 1200 Soldiers Field Rd.,

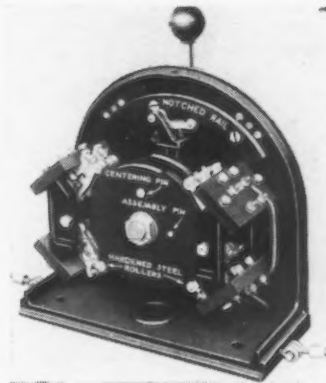


Boston 34. The locking frame type has eight positions and one reset position. In this type, any switching combination which has been set can be released by one operation of the reset button. The switch, known as the Master Model MPB, is of sturdy construction, with all parts made of noncorrosive materials. The contacts are fine silver, permanently riveted to the phosphor-bronze contact springs. The rating is 5 to 10 amp, 125 v, 60 cycles ac.

Master Switch

FOR use with mill and crane magnetic controllers, the type CM master switch has been announced by the *Electric Controller & Mfg. Co.*, 2700 East 79th St., Cleveland 4. This switch is of the cam type, having silver alloy contacts normally spring-closed and

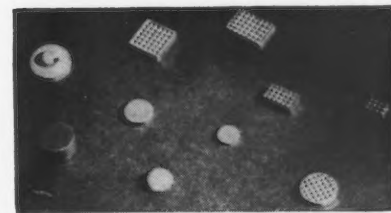
opened by 7-in. diam cams. The use of large diameter cams results in saving in motion by the operator, and reduces mounting space requirements. Cams are mounted on the shaft and keyed in position by a centering pin, screwed into the keyed roller arm bracket. The



assembly pin identifies the arrangement of cams for right or left hand operation. The notched centering device rail is so located that increased roller-spring pressure is automatically obtained as the lever-arm is advanced to the full on-position. This offsets the weight of the operating lever without sacrificing ability to inch between off-position and the first points.

Switch Facing Material

DEVELOPMENT of a silver-molybdenum alloy, called Calinite type SM, has been announced by the *Callite Tungsten Corp.*, Union City, N. J. This product is a high conductivity facing material suitable for facing of contact sur-

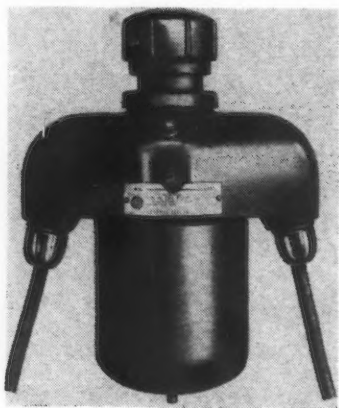


faces in switch gear designed to handle heavy currents, and for applications requiring high current where pitting, sticking or welding of contacts occurs.

Oil-Fuse Cutouts

ANNOUNCEMENT of an improved line of heavy-duty oil-fuse cutouts for overcurrent protection of power distribution systems in the 2400, 4160, 4800, and 7200-v classes has been made by the Transformer Div. of the

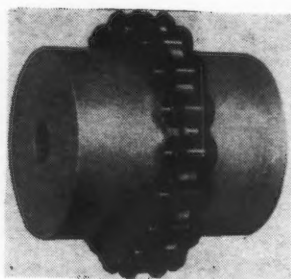
General Electric Co., Schenectady
5. Universal fuse links which provide higher interrupting ratings, clearing fault currents as high as 11,000 amp, depending upon the rating, have been utilized. With this design, 100, 200 and 300-amp



rating cutouts with maximum short circuit interrupting ratings previously limited to 2500 v are extended to 5000 v. A high degree of safety is provided by the cutouts, it is claimed, as there are no exposed live parts and no arc flames are ejected during current interruption.

Chain Type Couplings

A CHAIN type industrial coupling, known as the Flexoid Slo-Speed coupling, has been developed by the *Smith Power Transmission Co.*, 1545 East 23rd St., Cleveland 14. Standard roller chain is used entirely to simplify replacements and repairs. Each hub is independent of the other and is



connected by means of a roller chain and therefore the chain is in operation very similar to that on a standard roller chain drive. The Slo-Speed coupling will shear the shaft on which it is applied without the coupling failing and in event it is necessary to replace either the driver or driven unit, it is only necessary to take apart the connecting link in the chain, unwrap the chain, and the unit can

be moved either horizontally or vertically without disturbing the hubs on the shafts. The coupling can be rated on the strength of American Standard chains and the hub diameters are maximum for the sprockets, which means that maximum bores can be used. Five sizes, using manufacturers' standard No. 50, 60, 80, 100 and 120 roller chain, which are all being used on 18-tooth sprockets, are available.

Magnetic Relay

DESIGNED by the Instrument Div. of *Thomas A. Edison, Inc.*, West Orange, N. J., a sensitive magnetic relay, model 103, is available for use in the electronic and industrial fields where relays are required for operation on currents of thermocouple and photo-cell magnitudes and in equipment where compactness, lightweight, and dependability under vibration are of primary importance. It is said to be useful as a polarized relay in vacuum tube circuits, in balanced circuits, and in applications requiring pull in and drop out at essentially the same current or voltage. In extremely delicate control circuits, this relay can be used to help shrink mechanical design by eliminating intermediate amplification. The entire mechanism is protected against weather and dust by a gasketed metal cover and it is balanced to allow operation in any position.

Transformer Adjustment

A SIMPLIFIED adjustment on its distribution transformers, a ratio adjuster which replaces the link type connection block, has been developed by the *Standard Transformer Co.*, 119 Dana St., Warren, Ohio. No tools are needed to change the ratio. The handle operates above oil level and working parts of the ratio adjuster are immersed in oil. Contact between the bridged and stationary contacts is positive with Standard's spring set, snap action assembly.

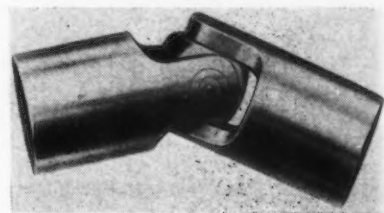
Appliance Wire

FOR use where both heat and moisture are a problem, a Deltabeston appliance lead wire has been announced by the Appliance and Merchandise Dept. of the *General Electric Co.*, 1285 Boston Ave., Bridgeport 2, Conn. This wire is insulated with a moisture-resisting cellulose acetate wrap

next to the conductor, a layer of felted asbestos and a lacquered glass braid overall covering. Its operating temperature is 257°F. The wire is available in white, red, green, blue, brown and black, with the color of the overall glass braid being permanent.

Universal Joints

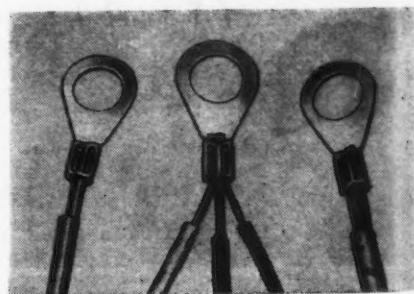
A NEWLY designed steel universal joint has been released by the *Brooks Equipment Corp.*, 217 Hudson St., Hoboken, N. J. The joint employs a device which



provides a positive lock for the pins and a convenient method of disassembly. The heat treated alloy steel used is precision ground and strength and even distribution of wear is said to be acquired by employment of a symmetrical design for pins and blocks. For convenient handling the joints are rust-proofed and individually packaged.

Solderless Wire Connections

BOTH installation tools and terminals for attaching solderless connections to solid wire, or a combination of solid and stranded wire, or stranded wire, have been perfected by *Aircraft-Marine Products,*



Inc., 1591 L North 4th St., Harrisburg, Pa. This mechanical connection made by a crimping operation is said to withstand vibration and torsional twist. Conformation of the crimp for solid wire is such that no air space exists inside the terminal, it is claimed, making full surface area contact with the conductor. Terminals are all-copper, hot electro-tinned for maximum electrical conductivity, available with installation tools for wire sizes 22 to 10 inclusive.

*Here's why
You can expect*

**Less Down-time
Better Production
Greater Savings**

with

ace

(GROUND-FROM-THE-SOLID)

drills

Recently a multiple spindle drilling operation in an automotive plant was fast becoming a bottleneck because of inefficient drill performance.

Ace Drill Corporation, one of nine drill makers called in an effort to remedy the trouble, supplied the manufacturer with a number of Ace Drills taken at random from stock.

Although this increased production 100%, the Ace Drill salesman, still not satisfied, continued his study of the problem. Finally he recommended Ace cobalt high speed drills which reduced down-time for the machines from 87½ hours to 19¾ hours for a like period of time.

You too will experience better drill performance with Ace Drills because Ace quality remains consistently high. Uniform hardness is achieved by passing 12 ft. long bars of high speed steel through a double dip hardening furnace in a continuous line—bar after bar. These cylindrical bars having a uniform cross section can be heat treated far more effectively and uniformly than a fluted drill having both heavy and very thin cross-sectional areas which restrict heat treat temperatures.

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ACE DRILLS
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THEY HAVE
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13833 JENNINGS STREET

DETROIT 27, MICH.

Assembly Line . . .

WALTER G. PATTON

• Replacement parts shortage is acute . . .
Many vital engine parts relatively unobtainable . . . Auto producers to have training programs.



DETROIT—The automobile industry of today may be likened to a giant who is attempting to hold off two great crowds of wild eyed, car hungry buyers. Figuratively speaking, with its left hand the industry is trying to keep several million impatient would-be buyers of new cars at arm's length; with its other hand, the industry is struggling just as energetically to satisfy the even more impulsive horde of automobile owners who are desperately in need of replacement parts to keep their old cars running.

It would be difficult to say which is the more difficult job, keeping hungry new car buyers happy or satisfying the present car owner who, denied a new car, instinctively is inclined to feel that he is being discriminated against if the industry can't deliver immediately just one small part that is required to keep the old jalopy running.

It should be remembered that practically all the conditions which are limiting the production of new cars also apply to the automobile parts industry. Strikes and material shortages have been just as destructive in preventing production of replacement parts as parts for new cars. In addition, many new conditions have been introduced in the replacement field which never existed before in the history of the

industry and these new obstacles must be added to the difficulty that is being experienced in producing original equipment.

The beginning of the present difficulties goes back to the suspension of car production and a subsequent government ruling declaring that certain non-functional parts such as fenders, doors, hoods, grilles and other metal items could not be produced for the duration. Meanwhile, with no new car production taking place, the demand for replacement parts was multiplying until today it is believed to be of an all time high. With the age of motor cars on the highway averaging about 10 yr, the industry faces a condition which has never before existed. Naturally, the demand for replacement parts has increased almost in proportion to the increase in the age of the cars in operation; and it is probably true that only gasoline restrictions and the fact that cars were relatively well cared for during the war has kept the present demand within bounds.

Another factor which has influenced the present replacement parts picture is the scrapping of dies during the war. In normal times, motor car producers can estimate fairly closely their total requirements for replacement parts. The usual practice is to save dies for several years, estimate the all-time requirements for parts for a certain model and then make what is called an alltime run before the dies are scrapped.

Dies runs made during the war not only under estimated the all time requirements but there were also a number of instances in which a shortage of materials or the necessity of clearing the plant for war production was so urgent that the replacement parts schedule got clipped in the process.

WITH the demand for replacement parts greater than ever before, with steel and supplies of parts short of normal requirements and dies destroyed, the industry has naturally been badly crippled in its efforts to meet car owner's requirements. Auto wreckers have, of course, been called on

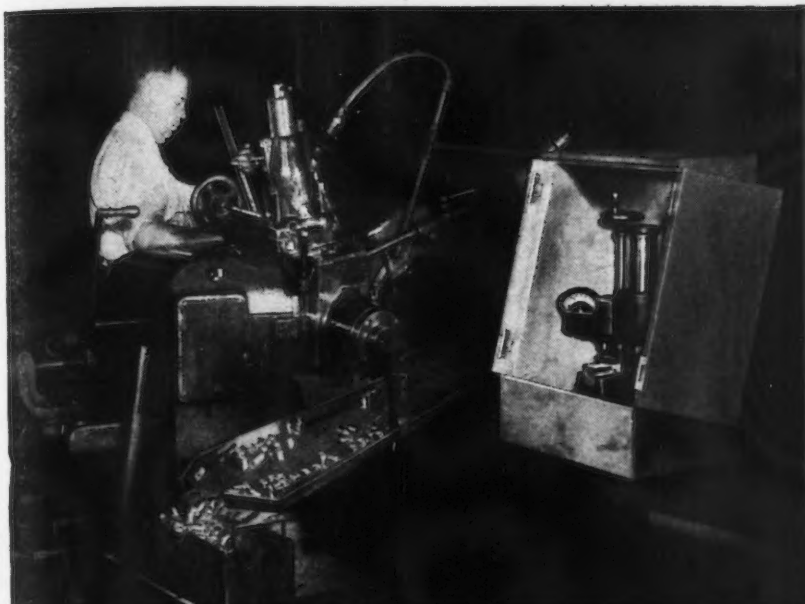
to supply many parts that are not available from the usual trade sources and in stripping cars to the bone to meet this demand they have also reduced the amount of scrap that would ordinarily flow back into steel mills to provide new steel. Today, however, supplies of used parts in the hands of yards are only a fraction of normal and ingenious practices such as welding together as many as four small pieces to make a replacement fender have been reported.

Another factor in the replacement parts picture is OPA which has lifted price ceilings from original equipment parts but had not decontrolled replacement parts up to the time the agency was temporarily shelved by Congress. The net effect of this OPA ruling has been, of course, to divert some parts production from replacement to original equipment although the amount of such diversion has been small, partly because the demand for replacement parts has been so insistent and also because the necessity for furnishing both kinds of parts to established customers has naturally kept parts builders in the replacement field even when parts were being produced at a financial loss.

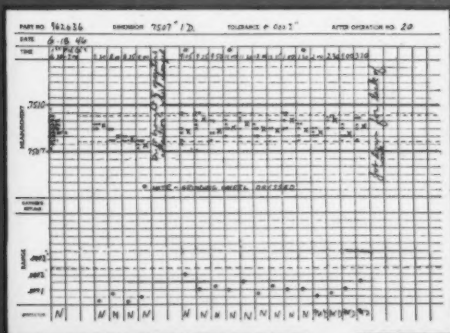
A bulletin recently issued by the Automobile Manufacturers Assn. discloses some of the measures being taken by car producers to relieve the famine in the replacement parts field.

For example, car dealers are being urged to search their establishments for now scarce items possibly overlooked and forgotten. Company field men are instructed to notify the factory immediately when scarce parts are located. In a typical case, a crankcase for a 1937 model was finally found in Mississippi where a dealer had abandoned all hope of selling the part. In another instance a bearing was flown from Atlanta to Wisconsin where an owner's car had been out of service for over 5 months.

Manufacturers' order books reveal that replacement backlog orders have jumped as much as 400 pct within the past year. It has also been established that a lack of

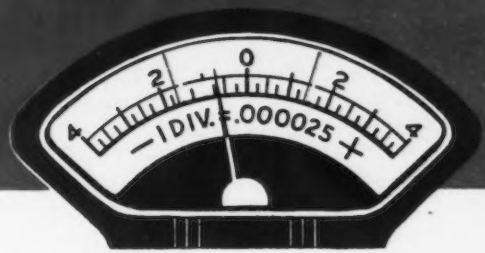


P&W Electrolimit External Comparator



Control Chart

P&W Electrolimit Internal Comparator



*For Best
Results from*

STATISTICAL QUALITY CONTROL

Interchangeability of parts is fundamental to today's production. One of the modern ways to maintain interchangeability is by statistical quality control methods that visualize the working control limits within which variations are allowed to deviate from the standard.

Effective statistical quality control requires gages possessing characteristics of *high-sensitivity, readability, accuracy, stability and gaging speed*. P&W Electrolimit Comparators — both external and internal — meet these requirements.

P&W Comparators are extremely sensitive instruments, yet heavily constructed to withstand constant shop use.

They are a proved investment in production plants because they help to *reduce manufacturing costs, improve quality and increase production*.

Write on your company letterhead for further information and the assistance of our engineers in establishing or improving statistical quality control in your plant.

PRATT & WHITNEY

Division Niles-Bement-Pond Company

WEST HARTFORD 1, CONNECTICUT



THE IRON AGE, August 1, 1946—73

essential repair parts is taking an increasing number of cars off the roads; auto factories are today receiving four letters for every letter received in the fall of 1944 informing the manufacturer of inability to find necessary parts.

Vital functional parts now vir-

gram is enjoying considerable success.

Several months ago a national program was launched by the Fisher Body Div. of General Motors which is designed to simplify and improve body repair methods and to aid car dealers in the train-

scarcity of steel and replacement parts continues, body repairs must be made, if at all, using a minimum amount of replacement materials.

EIGHT specially designed Fisher Body training units are currently touring the country. Each is equipped with cutaway halfbodies and tools to make body repairs. Specially trained men accompany the units to give instructions to thousands of mechanics in approved body repair methods and in the newly-developed technique which is well described by its popular name, "partial panelling."

It has been estimated that more than 6000 men have already received instructions from the six mobile units and two additional units which are transported by rail to large urban centers. As time goes on dealers and garage operators will be able to draw on an expanded supply of skilled and semi-skilled workers for body repair work. War workers and veterans who received special training in metal work, particularly those who worked with hand tools on aircraft, are reported to be attracted by the new Fisher Body-GM training course.

This is said to be the first comprehensive national program of its kind attempted by the automobile industry. However, in view of present successes and the appalling lack of skilled workmen to build new cars and to keep vehicles on the road in satisfactory running condition, it is quite likely that the automotive industry will, in the near future, be compelled to launch similar or modified programs to compensate for the national deficit of skilled workers and materials.



IT TAKES MORE THAN MOTORS TO MAKE A MOTOR CAR: *Waiting for other necessary components, these newly designed 6-cylinder engines for the 1947 Frazer are being stockpiled at the Willow Run plant for future manufacture. The engines, developed by Continental Motors and Graham-Paige engineers, develop 100 hp. In the photograph, inspectors are checking the units before they are moved up in position for the assembly line.*

tually out of supply include crankshafts, connecting rod and main bearings, wormshafts and certain roller and ball bearings used in steering mechanisms, clutch throw-out bearings, cylinder head gaskets, transmission parts, mufflers, brake drums and even door locks for some models.

Thus both non-functional and functional replacement parts for cars are desperately short and until new materials, new dies and the necessary knowhow are brought together the present situation can hardly be expected to improve.

IT is interesting to note, however, that a constructive move has been made to improve the present shortage of non-functional replacement parts and that the new pro-

ing of skilled body repair personnel.

The service is available to all GM car owners but particularly to those who will be compelled to maintain the utility of their present automobile until new cars again become plentiful.

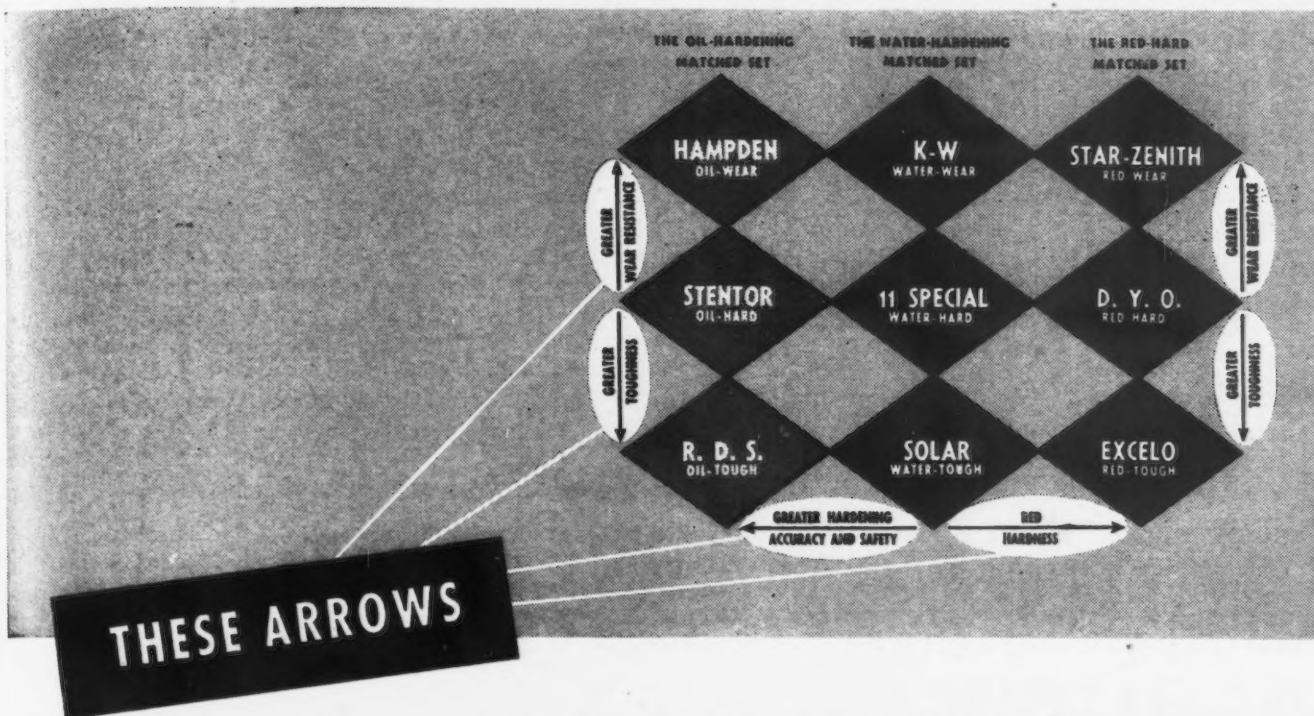
A body repair service manual gives a step-by-step description of modern repair methods. Mechanics are taught how to repair badly damaged door panels and other body sections so that the present parts will continue to serve until new parts again become available. In normal times it would often be more economical to replace entire body sections than to make extensive body repairs such as is being done today. However, so long as the

Willys Starts Delivery Of Jeep Station Wagon

Detroit

• • • Deliveries were being made this week to dealers of Willys-Overland new station wagons which are equipped with an all steel body with a paint coating grained to simulate wood.

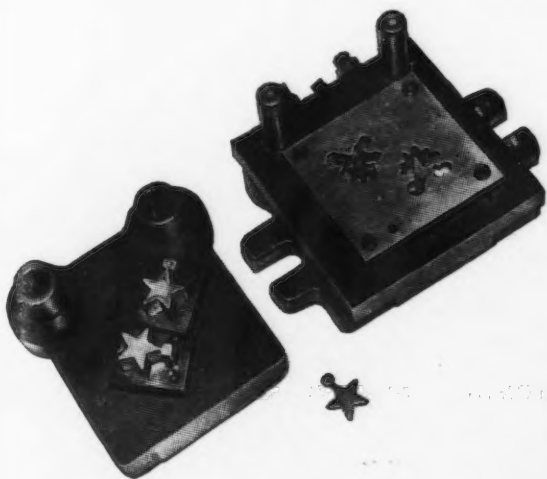
The Willys station wagon, powered by a 63-hp jeep engine has a 104-in. wheelbase, and an overall length of 175 in. and weighs approximately 2800 lb. Seating capacity is furnished for a maximum of seven passengers and the seats can be removed to leave room for cargo.



POINT YOUR WAY TO LOWER COSTS, MORE OUTPUT PER TOOL

The arrows shown here are your signposts on a four-lane highway to lower unit costs and increased output per tool. When you "follow the arrows" on the Carpenter Matched Set Diagram, you're "custom-fitting" the tool steel to the job—assuring yourself that the tool you make will cut costs and increase output because you know it's "right for the job". And with the help of the Carpenter Matched Tool Steel Manual, you get accurate, complete heat treating instructions for all nine steels listed on the diagram.

HERE'S ONE EXAMPLE OF THE RESULTS YOU CAN GET BY FOLLOWING THE MATCHED SET DIAGRAM



Delicate points on a Blanking and Trimming Die frequently "sheared off" when punching out Bronze Alloy Stars made from .085" thick work-hardened material. The tool maker decided to follow the arrows on the Matched Set Diagram and selected Carpenter R.D.S. Tool Steel for greater toughness. The new die outlasted the old one 4 to 1 and with fewer tools to make, the company saved considerable time and money on the job.

Put this cost-reducing Matched Set Method of tool steel selection to work in your plant. "Follow the Arrows" and you'll follow the trend to lower costs and increased tool output. Ask your nearby Carpenter representative or write us on your company letterhead, indicating your title, for your free copy of the 168-page Carpenter Matched Tool Steel Manual. Get in touch with us today.

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Carpenter
MATCHED
TOOL STEELS



Washington . . . ■ ■ L. W. MOFFETT

• War Dept. budget asks \$14,580,000 for industrial mobilization . . . Larger portion of total wanted to place 34,300 machine tools in standby storage.



WASHINGTON — Tucked away in the War Dept. budget for 1947 was an obscure item of \$14,580,000 requested by the Army Air Forces for "industrial mobilization and planning."

A relatively small amount in these days when it is customary to speak glibly of billions; it nevertheless is of great interest to industry as well as highly important to the AAF to which it represents, in effect, partial insurance against being caught off-base in the event that a future emergency should develop which would call for rapid expansion of plane production facilities.

Industrial mobilization and planning is not to be confused with the term research and development for which the appropriation is many times greater. The former is confined to ways and means of getting plants into greater and more rapid production should an emergency threaten.

By far the larger portion of the requested appropriation will be expended for the purpose of placing in standby storage approximately 34,300 general purpose machine tools and production equipment. Since the average cost of preparation for storage is \$350 per tool,

including \$50 for transportation to the point of storage, the plan calls for an initial outlay of about \$12 million.

After this is accomplished, the annual storage and maintenance bill is expected to amount to about \$80,000 annually or slightly more than \$2 per piece of equipment.

The remaining \$2½ million would be invested by the military in industrial studies and the preparation and revision of plans by which industry could swing into rapid aircraft production should such an emergency develop. In this atomic age, obviously uppermost in the minds of procurement officers is the fact that it requires approximately 9 months to completely tool up a plant for mass production.

"The importance of production planning and study of the various other phases that go into the general plan for manufacture of an item cannot be over emphasized," declares one AAF staff general. "Our studies show that by having such a plan ready we can decrease the time required for expansion of the Air Forces quite materially. It is not so much a problem of what we have under such circumstances as what we can get quickly."

UNDER the AAF plan, some 26,702 of the reserve items would be various types of major machine tools while the remaining 7583 would be concerned with secondary metal forming and cutting machines and production equipment. All would be general purpose tools, suitable for almost all kinds of machine work but it is axiomatic that none would be selected which would not be suitable for use in aircraft factories. An additional point emphasized in the selection was that the rate of obsolescence is much lower than in the case of special purpose equipment.

More specifically, the machine tools selected by the AAF for reserve storage were:

Grinding, 6340; drilling, 5789; turning 5575; milling, 3475; boring, 990; precision boring, 650; gear cutting, 922; broaching, 300; planers, 105; and miscellaneous, 2556.

Included in on the secondary metal forming and cutting machine and equipment list were:

Electric welders, 2033; mechanical presses, 1135; shearing and punching machines, 1120; bending machines, 1010; hydraulic presses, 610; forging machines, 500; wire forming machines, 150; gas welders, 110; and miscellaneous, 915.

This set-aside of tools for preservation is, of course, separate and apart from those which equip the plane plants retained by the government. These plants are kept in production by leasing them to private operators for rental fees determined by negotiation.

* * *

A FEDERAL Trade Commission decision having an important bearing on basing-point systems should be handed down before the end of the year.

The case in question involves the Chain Institute, Inc., and member companies in the chain producing industry. They are charged with conspiracy to fix identical delivered prices for chain products, in violation of the FTC Act, and price discrimination in violation of the Robinson-Patman Act.

Actually, what is under fire in this case is a multiple basing point system as well as a zone system of pricing. FTC will probably throw the book at this group.

FTC's original complaint in the case was made on Dec. 22, 1942, but in the interest of the war effort proceedings were put off until the end of the war. It was reopened again on Oct. 9, 1945. Several hearings have been held since that time — the latest on July 18. Another hearing is set for Aug. 6, and the final hearing should be the one scheduled for Oct. 22. The trial examiner's report will then be prepared for submission to the Commission.

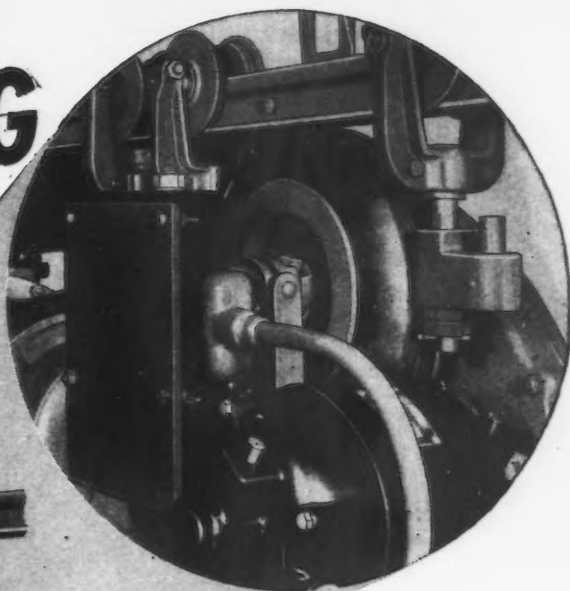
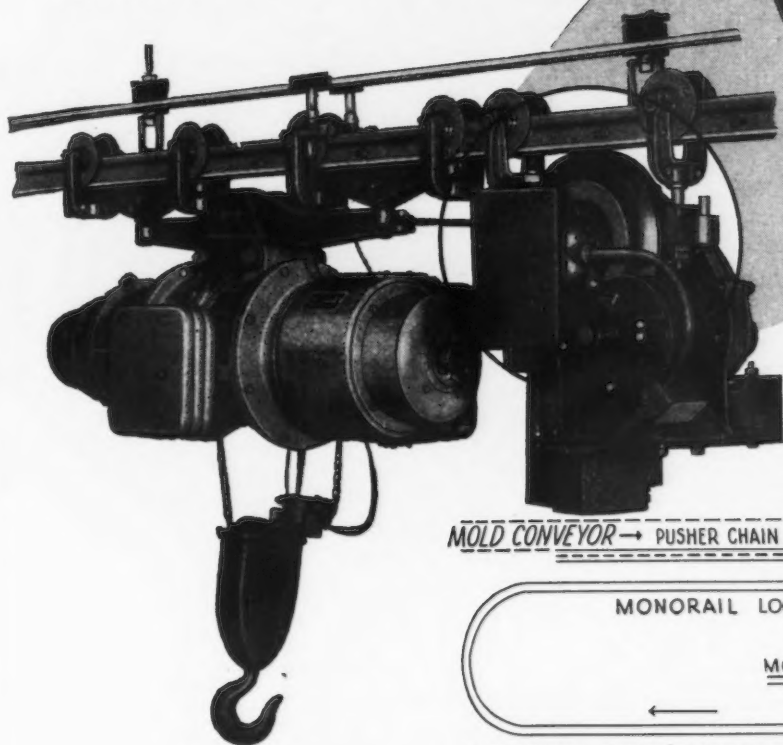
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WORKERS in the Japanese metals industry are still among the highest paid laborers in that inflation-ridden country.

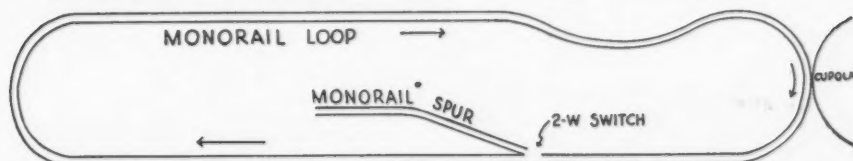
According to a report of the Welfare Ministry on the income of workers for the month of May, the highest income for male workers was 684.93 yen—paid by the metals

FASTER POURING

with "Free-Wheeling"
AMERICAN MONOTRACTOR



MOLD CONVEYOR → PUSHER CHAIN SYNCHRONIZED WITH FLOOR CONVEYOR



LAYOUT OF POURING LOOP FOR CYLINDER HEAD LINE

Here is another example of American MonoRail engineering with the American MonoTractor.

A rubber drive wheel propels a heavy bull ladle from the cupola to floor conveyor carrying flasks. When the unit reaches the pouring area, clutch disengages the MonoTractor drive wheel so that carrier unit can be picked up by an overhead pusher and moved along over the flasks at

the same speed as the floor conveyor.

This enables the operator to concentrate all efforts on pouring. No worry about "keeping up" or "getting behind" the flask—operator forgets about horizontal movement and is able to pour metal faster and more accurately.

This principle is applicable to many conveyor lines for process in motion. Let an American MonoRail Engineer go into further details.

THE AMERICAN

MONORAIL

COMPANY

13103 ATHENS AVENUE • CLEVELAND 7, OHIO

THE IRON AGE, August 1, 1946—77

industry. The highest income for male office workers was 847.14 yen in the textile industry. The highest income for women laborers was 300.05 yen, while the highest income for a female office worker was 304.88 yen—both in the chemical industry.

The minimum wage for male laborers was 362.17 yen paid by a metal jobber. The minimum wage for a male office worker was 523.73 yen paid by a regional steel firm. The minimum wage for female laborers was 174.60 yen paid by the food industry. The minimum wage for a female office worker was 246.64 yen in the metals industry.

The general work week in Japan has been 60 hr on a 10-hr daily basis.

However, the Jap take home pay is cut into by the inflation sweeping the country. The exchange rate fixed by the U. S. occupation authorities is \$1.00 equal to 15.00 yen, a rate which is out of line with the actual purchasing power of the yen. At the official rate, 1.00 yen equals 6.66 American cents, but the actual value of the yen, according to the most recent information, is about 0.76 of an American cent.

Black market rates have recently been about \$1.00 equal to 60.00 yen.

* * *

Top Ordnance officers say their contract with the General Electric Co. is making the Buck Rogers myth a reality. In this work the emphasis is being placed on the extremely long-range, ground-to-ground controlled missiles.

These giant rockets will travel more than five times faster than sound, capable of streaking into space and then, controlled by complicated robot "brains," dive with uncanny accuracy on a target thousands of miles away.

* * *

Comparative cost figures for runway construction show that as planes became heavier costs increased proportionately, due to the need for heavier protection under the runways. A runway to carry the P-38 costs about \$5.00 a yd, one for a B-24 about \$8.00 a yd. The B-29 runway costs up to \$9.00 a yd, and the new superbomber, the B-36, will require runways costing \$15.00 a yd.

New Building Technique Avoids Rafters, Trusses And Load Bearing Walls

Washington

• • • A novel method for the construction of temporary and permanent buildings which eliminates the need for rafters or trusses in the roof or for load-bearing walls is described in a report released recently by the Office of Technical Services, Department of Commerce.

The report, written by Paul Lester Wiener for the Office of Production Research and Development of WPB, describes a structural system to be developed.

The new system, called "Ratio Structures," is based on the use of a self-strengthening arch, supported on a series of free standing posts. By its use, buildings are erected from the roof down, rather than from the ground up.

The technique was used in building a war housing project at Sidney, N. Y., consisting of 160 houses and a community center.

The Ratio Structures system is effective whether metal, plywood, or composition board is used. Complete freedom in fenestration and other openings is afforded, since the outer wall panels bear no weight, and are actually supported by the roof-post system. According to Mr. Wiener, great savings in materials and in construction time are made possible by his method.

An adaptation of the system replaces the arched roof with a standard box-girder flat roof. The air space inside the box-girder can be used for air circulation, for insulation, and even for the installation of plumbing pipes, electrical wiring, heating and ventilating ducts.

The primary use for Ratio Structures is likely to be in the field of small public or industrial structures—hospitals, schools, warehouses, community buildings. However, the flat-roofed type particularly should have wide acceptability for low-cost housing.

Included in the report are extensive architectural and engineering drawings of all important details, as well as some floor plans for small houses, schools, recreational centers, and industrial buildings.

Copies of the report, PB-18529, is available free of charge from the Office of Technical Services, Department of Commerce, Washington 25.

THE BULL OF THE WOODS

BY J. R. WILLIAMS





"Measuring at the Machine"

MINIMIZES PRODUCTION LOSSES!

Reducing production LOSSES means reducing production COSTS. LOSSES usually occur at the machine—stopping such losses brings down costs.

"Measuring at the Machine" brings the following advantages which contribute to being able to sell a product profitably at or under competitive prices:

- 1 When accurate gaging is practiced right at the production machine, scrap losses have been reduced as much as 80% and 90%.
- 2 "Measuring at the machine" practically eliminates salvage work which is nearly always costly.
- 3 Component parts reaching the assembly line fit quickly and easily—no assembly time lost. Instead of working to the high limit as an operator normally does, he works to hit the part "on the nose."

- 4 When high production gaging instruments like the Multichek, Precisionaire and Visual Gage are used at the machine, the floor space devoted to inspection operations, gage maintenance costs and the labor cost of inspection are all greatly reduced.

- 5 Under close dimensional control, finished products give maximum performance, greater service life, and help build prestige for the manufacturer.

- 6 Fewer parts will wear out in service, and then replacement is quickly and easily done—no laborious fitting in the field will be necessary.

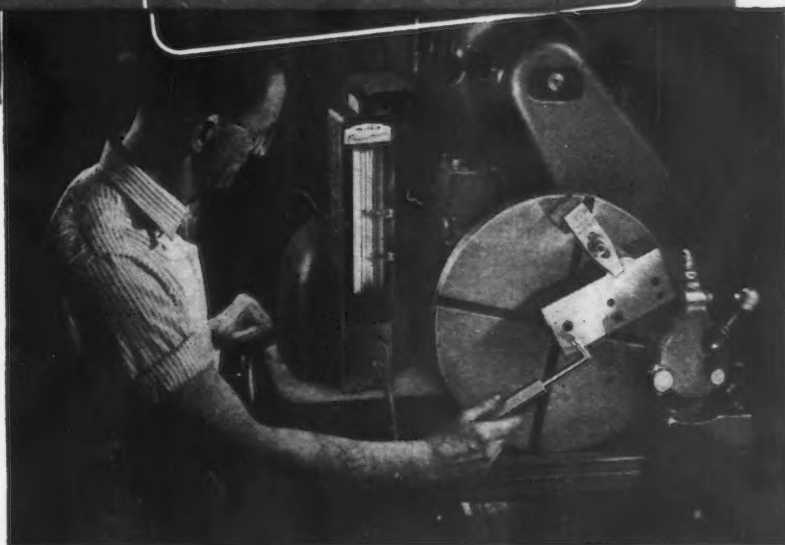
chek with Sheffield
on
"Measuring at the Machine"



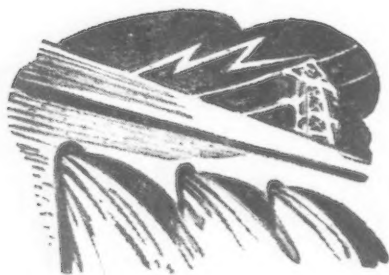
**THE SHEFFIELD
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Dayton 1, Ohio, U. S. A.

MACHINE TOOLS...GAGES
MEASURING INSTRUMENTS
CONTRACT SERVICES



• **Philippine Republic reported to be excellent market for all American made products . . . Portland steelworking plant goes on block . . . Bridge problem faces Bay Area.**



LOS ANGELES—Faced with a 10-yr reconstruction job, the Philippine Republic affords an excellent market for many types of American made products. The smart American businessman should allocate a small percentage of his products to the development of this market, in the opinion of Morris B. Pendleton, president of Plomb Tool Co., recently returned from an industrial survey of the Philippine Republic. Mr. Pendleton pointed out, in an interview with *THE IRON AGE*, several advantages of trading with the Philippines—no tariff barriers, no financial problem as the peso is pegged to the dollar, and the good credit of the importers. Eight years of free trade, to be followed by a graduated tariff for 20 yr, will also facilitate trade with the new republic, according to this investigator.

The basis of the country's economy—factories, wharves and mines—were systematically destroyed by the Japanese, Mr. Pendleton reported. This has created a crying need for all types of machine tools, metal products, to construct new factories, office buildings and transportation facilities. The people as a whole are potential active customers for all types of American goods from household appliances and electrical equipment to boats and airplanes, it is reported.

Aircraft production methods will be applied here to still another item for postwar use—an unsinkable aluminum alloy rowboat. Douglas Aircraft Co. announced that its Santa Monica plant will employ production line technique for quantity manufacture of an all-purpose lightweight boat.

Pre-formed aluminum alloy will be used for the three sections of the outside shell, with all sections joined by rivets and spotwelding. Each side will be formed by one long section and a small endpiece will make the stern.

The boat will weigh 70 lb and seat six adults. Dimensions are 10-ft length, 4-ft beam and 17-in. depth. The unsinkable feature of the craft is made possible by construction of a flotation tank under each seat.

Designed as a sportsman's boat, the craft will be constructed with provision for two rowing positions and attachment of an outboard motor. The boat is also expected to be used as a yacht tender, the lightweight construction allowing sailboats additional speed and stability and eliminating the use of davits to raise and launch the tender.

According to Douglas, painting, scraping or calking will not be required and the craft will be non-corrosive in either fresh or salt water.

INVESTMENTS in new and expanded industrial facilities in the Los Angeles area during the first 6 months of 1946 were larger than those in either the full year 1944 or 1945, according to the Chamber of Commerce.

First half investments amounted to \$92,311,986 and created jobs for 17,803 persons in the Los Angeles industrial area, including the county and adjacent territories.

In the same period, 142 new plants were established or had announced an intention to locate here, calling for employment of 11,261 persons and representing investments of \$53,123,000.

Drake Steel Supply Co. has opened a new Wire Products Div. in the face of extreme shortages of this material. The management is planning to make a practice of no-

tifying customers of the arrivals of shipments available for distribution through its warehouses here and in Fresno, Calif., and Tucson, Ariz.

PORTLAND—This city is enjoying a brisk trade in the shipping of railroad locomotives to Guatemala and Russia.

Seven engines sold by WAA to the South American republic had been declared surplus by the Army at Bonneville and 18 units were built for the Russian government in eastern plants and assembled by the Willamette Iron & Steel Co. The Russian order totaled 1207 heavy 2-10-0 locomotives which will be completed by shipment of these 18 this week and one more within a few days.

Ending 30 yr as an important factor in the fabrication of iron and steel in this area, the Commercial Iron Works is being offered for sale.

Established in 1916 by the late William Casey for foundry, machine and engineering work, the company branched out into a heavy ship construction program during the war with the distinction of having built the first and last ships for the U.S. Navy in the Portland area in that period. Its contracts included net tenders, minesweepers, submarine chasers, landing craft support vessels, tugs and miscellaneous craft. A total of 200 ships were built and the payroll at the peak of employment reached 10,000 and today is said to be approximately 600. Present contracts with the Navy, merchant marine and Army Engineers will be completed, it is reported.

SAN FRANCISCO—From present indications the steel shortage will be a thing of the past by the time this area is ready to authorize another bridge over the bay between this city and Alameda county.

While transbay commuters line up bumper to bumper during peak hours, crowded lanes of cars side-wipe and crumple fenders—or worse—on the present span, the toll bridge authority, Chambers of Commerce, the U. S. Army and

Mixmaster OF THE MEGACYCLES

Even the clean, clear tones of FM radio can be only as sharp as the man who blends and controls them. Long learning and lots of doing teach him the touch, this rider of the gain... this *mixmaster of the megacycles!*

That same degree of training and experience is essential, too, with specialists in the transmission and control of power for Industry's busy machines.

That's why the manufacturers of Twin Disc Clutches and Hydraulic Drives have

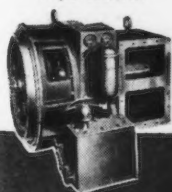
not depended on production and laboratory research alone. Twin Disc engineers are equally "at home" in the field... studying, analyzing and ironing out the latest wrinkles in power linkage.

This practical approach is one reason why so many leading manufacturers confidently look to Twin Disc for a sound solution to all their linkage problems.

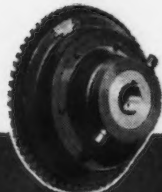
TWIN DISC CLUTCH COMPANY, Racine, Wisconsin
Hydraulic Division, Rockford, Illinois



Hydraulic
Torque Converter



Heavy Duty
Clutch



Machine Tool
Clutch



TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

REG. U.S. PAT. OFF.

Tractor Clutch



Marine Gear



SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

Navy and city officials on both sides of the bay wrangle back and forth over proposals favored by one or another.

The well publicized "Reber Plan" which involves causeways or fills instead of an overhead span is being opposed by the Oakland Chamber of Commerce and other East-bay interests on the grounds that it would "bottle up all harbor developments" on that side of the bay. Proposed by John Reber many years ago and promoted by him in the face of strong opposition, the Reber plan has recently been given serious attention by engineers, many of whom believe it to be the practical solution to the problem. The chief merits of the plan, according to its promoters, is that its cost would be comparable to, or less than, another overhead span; that its causeways would carry a greater automobile traffic load and rail lines directly into this city; and that the land built up by a silting process behind fills, and new dock space created would help pay the cost of the project.

Opponents declare that such a gigantic earth and rock moving job would be expensive; would result in the destruction of existing harbor facilities; would take longer to complete; and would be a barrier to the free movement of shipping.

The entire subject is to be given

a public airing before an Army-Navy board starting Aug. 12 here and a record turnout of public officials and civic organizations is expected.

* * *

A book just published by the Judson Pacific-Murphy Corp. titled "A Romance of Steel in California" is receiving considerable attention among local steel men. Profusely illustrated, the volume covers the history of this company from 1866 when the Pacific Rolling Mills was organized; through its merger with the structural fabricating dept. of the Judson Mfg. Co. in 1928 to become the Judson-Pacific Co.; and the culmination of its development with the combining of the Judson-Pacific Co. and the J. Philip Murphy Corp. in 1945.

The first rolling mill in California, according to this book started producing hot-roller iron bars ranging in size from $\frac{1}{4}$ in. to $1\frac{1}{4}$ in. diam and flat bars from $\frac{1}{2}$ to $1\frac{1}{2}$ in. wide in 1868. The mill was a single three-stand, 8-in. guide mill. Scrap purchased at \$12 a ton was converted into \$75 a ton iron.

Present officers of the Judson Pacific-Murphy Corp. are: P. F. Gillespie, president; J. Philip Murphy, vice-president and general manager; and Carlos J. Maas, vice-president.

Baldwin Sales for Year Total \$105 Million

Philadelphia

• • • Charles E. Brinley, chairman of the board of the Baldwin Locomotive Works, reported that consolidated sales of the company and its wholly owned subsidiaries for the 12 months ended June 30, 1946 were \$105,005,919; and that the amount available for transfer to surplus for the period was \$3,632,297 after all charges and after including a credit of \$1,300,000 transferred from reserve for contingencies. During the 12 months, dividends of \$756,763 were received from The Midvale Co., of whose capital stock Baldwin owns 63.25 pct.

Mr. Brinley called attention to the transfer of \$1,300,000 from the reserve for contingencies which was created during the war years, and stated that the board of directors approved the return of this reserve to profit and loss account, to partially offset expenses resulting from major interruptions of production during the first half of 1946, caused by strikes in the Baldwin plants as well as in the plants of many of its suppliers.

Ohio Forging Plant Is Declared Surplus

Cleveland

• • • A forging plant, formerly leased and operated by Champion Machine & Forging Co., has been declared surplus and is offered for sale or lease by War Assets Administration, according to Col. John A. Retter, deputy regional director, of the Office of Real Property.

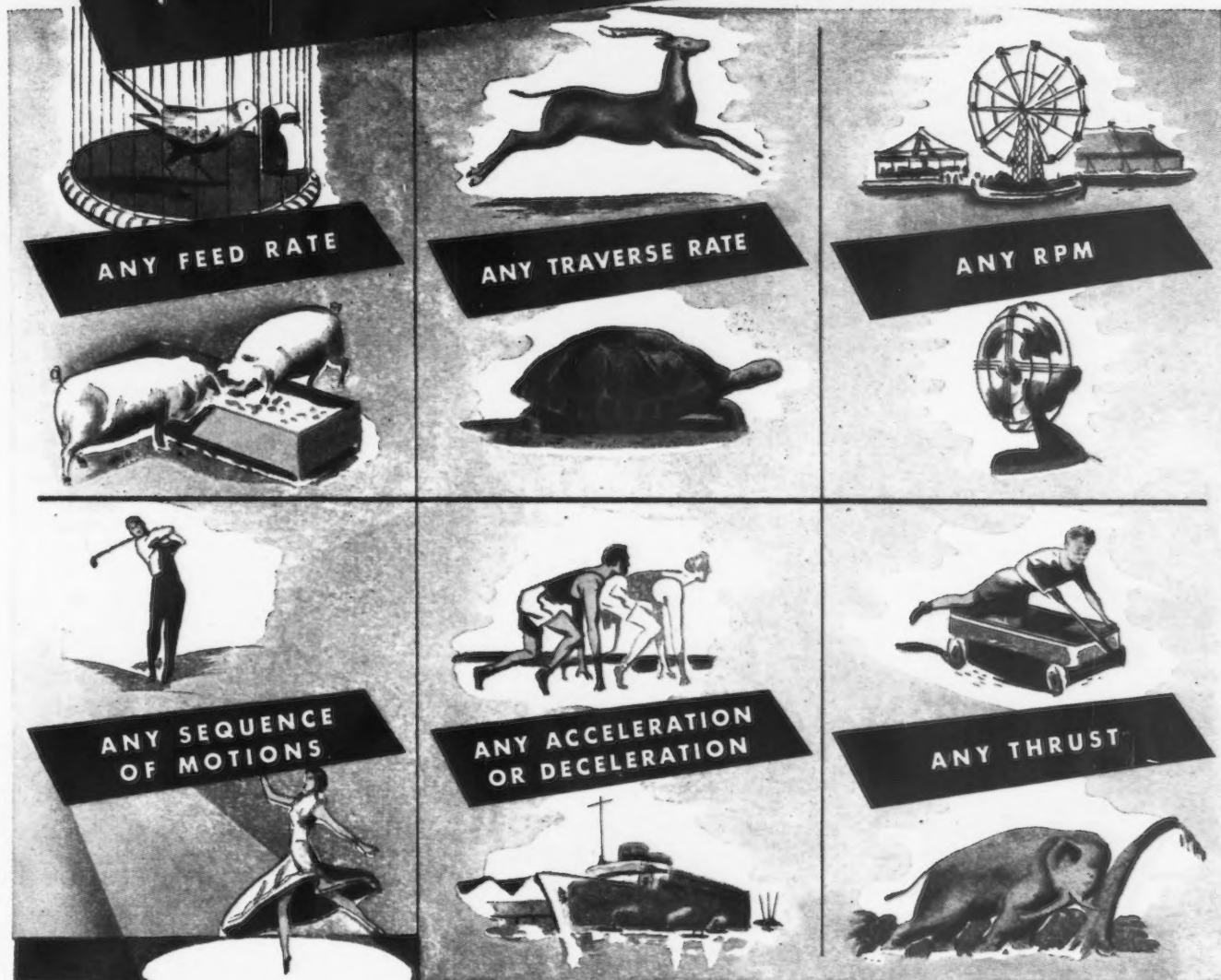
The plant consists of five buildings with a total floor area of about 117,000 sq ft, situated on about four acres of land. Buildings include a forge shop, boiler house, die storage, transformer office and machine shops. Various power and portable tools and testing equipment are included in the offer. The forge shop houses 27 cranes. Cost of the plant to the government was \$3,741,084.

The plant is offered for lease subject to the rights of the former lessee and with the provision that the drop hammer facilities will be preserved intact.

TURNABOUT: American Navy craft under repair at a Jap drydock at the Yokosuka Naval Base where a year ago Jap ships were being overhauled. Docks are also being used to scrap salvaged ships.



VERSATILITY that *Exactly* meets your needs in MACHINE TOOLS



Machine tool design is set free from a host of limitations when Vickers Hydraulic Controls and Drives are used. With no difficulty at all, the designer has an extremely wide choice of feed rates, traverse rates, RPM, sequence of motions, accelerations or decelerations, and thrusts.

Practically any machine tool can be designed and built to do exactly the required job by using Vickers Hydromotive Controls in one of the infinite number of combinations provided by more than 5000 standard Vickers Units.

In addition, positive overload limitations can be built into any machine—definite safety factors provided for both the machine and the operator.

Only Vickers Hydraulic Controls provide all the advantages of hydraulic operation—including exceptional compactness and reliability.

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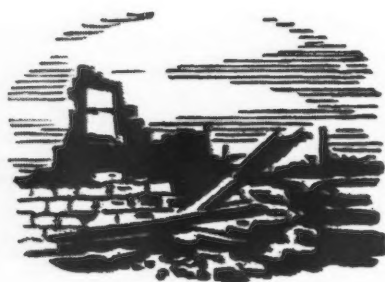
VICKERS Hydraulic CONTROLS and DRIVES

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

THE IRON AGE, August 1, 1946—83

European Letter . . . JACK R. HIGHT

• Letter to "Dear Editor" page posing the question "Where is the tin?" answered from Great Britain . . . Reconstruction of war damaged areas at base of question.



LONDON—The letter by Mr. M. A. Rollman of Landisville, Pa., on the July 11 "Dear Editor" page headed with the pertinent question "Where is the Tin?" was probably a reflection at least in part of something close to criminal negligence in reporting the activities of the International Tin Committee and other activities here in London, the hub of the tin producing world. There is very little in the way of immediate encouragement that can be offered to the small tin consumer, other than to suggest that he use every means within his power to lobby for the release of tin stocks now in government hands. The story of what has happened since VJ-Day in the major tin producing areas of Malaya and the Dutch East Indies is in my opinion typical of the reconstruction of war damaged areas in any place in the world.

Despite the urgent need of industry throughout the world for tin, there were certain realities which had to be faced as far as production was concerned. The first problem was that as far as expeditiously exploiting the tin fields was concerned the war against Japan ended much too quickly, and there was no organization ready in the Far East to analyze the damage and facilitate reconstruction. The first weeks and months were occupied by military authorities in physically taking control of the areas, and the economic exploita-

tion was a secondary matter. The first 6 months of 1946 have been occupied by survey parties which have assessed the damage, private producers planning for reconstruction, and appeals for government aid in procuring necessary materials, finances and priorities.

Thus, while the average consumer in America or Britain, preoccupied with production difficulties of his own, is not particularly interested in tin production problems, he can expect little beyond the 10 pct increase in allocations as announced by the CPA (see THE IRON AGE, July 11, p. 104), unless he lobbies for it.

WHILE in the minds of the tin producers the long term prospect for tin production from 1948-50 is more optimistic than it was last August, production in the first and second quarters of 1946 (which would be most likely to affect immediate allocations) was disappointingly low. While the official British Colonial Office analysis of the Malayan tin situation early this year predicted the production of 12,300 long tons of metallic tin, there is general agreement today that due to belated deliveries of machinery the estimate was over-optimistic. Malay Straits metallic tin production as of May 31, 1946, for the year totaled only 802 long tons.

Admittedly this was a start, and though production in the last half of the year will be far greater, production of 12,000 tons seems entirely out of the question. A somewhat parallel condition exists in the Netherlands East Indies which was the other war ravaged producing area, where official sources predicted 10,000 long tons of metallic tin production in 1946, but deliveries in the first 6 months remained low. Despite the fact that Bolivian, Belgian Congo, and Nigerian production is remaining fairly static, the tin allocations group in Washington would be counting on new and promising production statistics from the Straits and the Indies upon which to base increased allocations, unless they planned dipping into their large stockpiles certainly justified now that production is mounting every day. In consideration of the

TIN ALLOCATIONS

(Long Tons)

Country	March, 1946 Allocation	June, 1946 Allocation
Canada	1500	1070
Denmark	200	140
France	4260	2840
Finland .....	.....	150
India	960	640
Italy .....	.....	533
Persian Gulf ..	.....	10
Middle East ...	350	29
Netherlands ...	360	240
Norway	220	52
Shanghai .....	.....	20
Latin America.	200	400
Sweden	200	300
Switzerland ...	400	400
Turkey .....	.....	100
U.N.R.R.A. ...	3000	202
U.S.A.	6650	2350

Totals..... 18300 9476

SOURCE: Tin.

disappointing results in these two areas for the first half of the year, the 10 pct increase in allocations was almost purely a concession from stocks.

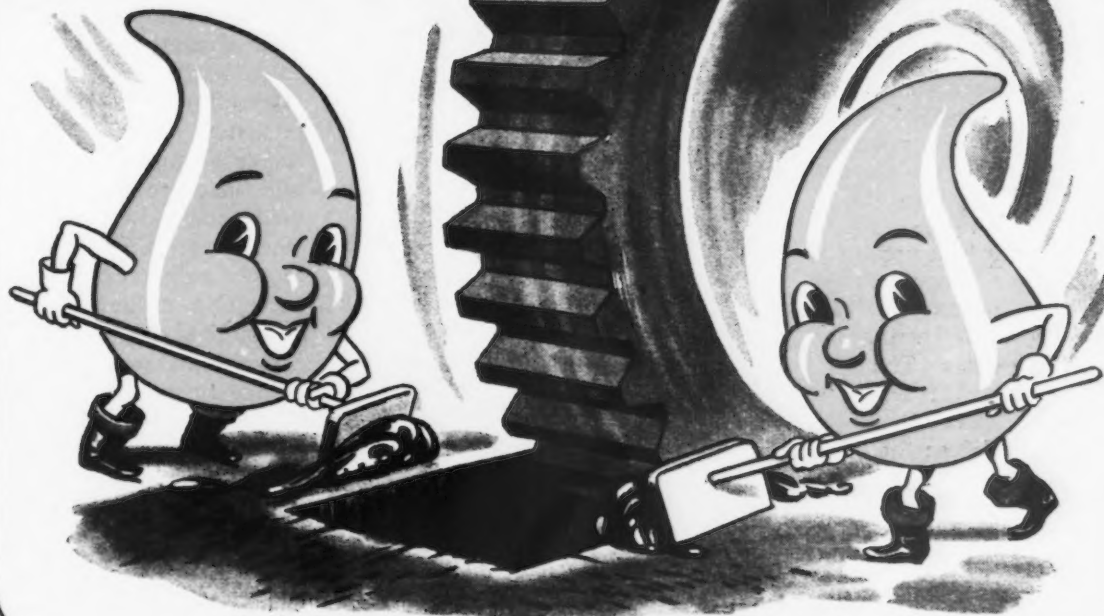
Interestingly enough the Tin Producers' Assn., located here in London, while favoring the continued rationing of tin to consumers, feels that stockpiling policies both in Britain and the U. S. are over-conservative in light of today's conditions. The viewpoint of the tin mining companies is that all possible pressure is being applied to getting Far East tin production back on a prewar basis as rapidly as possible, but the only immediate relief that can be offered to consumers such as Mr. Rollman represents would be in increased allocations from stocks which can easily be replaced within 2 or 3 yr as current production reestablishes itself.

In answer to the ever pertinent question "Who has the tin now that the Japs took?" the reply seems fairly easy to obtain. Since 1941 all tin available to both Britain and the U. S. has been allocated by a combined allocations board in Washington. Included in this year's allocations are 2000 long tons of metallic tin captured in the Malay Straits in the Japanese stockpiles.

THE Combined Tin Committee in Washington, composed of representatives of the United Kingdom, United States, Netherlands,



Call the
**SHELL LUBRICATION ENGINEER as
the FIRST STEP to the RIGHT SOLUTION
of any LUBRICATION PROBLEM**



SHELL EXL GREASE OVERCOMES CHANNELING in Gear Case

PROBLEM: Electric hand-held tools designed for infrequent use were being operated continuously in a metal fabrication shop. After two days' service, gears ran hot and tools were noisy. "Channeling" of the grease was recognized as the cause of trouble, and, though a nuisance, a schedule of maintenance overhaul *every other day* had to be maintained.

SOLUTION: When the Shell Lubrication Engineer surveyed the problem, he recommended a Shell EXL Grease. This grease has the consistency required for gear-case

use, and also has a "slump" property by which it fills a channel cut by gears. Results were immediate. Gears ran cool, chatter ceased. Maintenance checks and re-greasing were extended to weekly intervals.

CONCLUSION: It pays to consult the Shell Lubrication Engineer, regardless of the nature or size of your lubricating problem. For informative literature about Industrial Greases, write Shell Oil Company, Incorporated, 50 West 50th Street, New York 20, New York or 100 Bush Street, San Francisco 6, California.

SHELL INDUSTRIAL GREASES



Belgium and France announced in June the further allocation of 9476 long tons of tin, bringing the total for the first half of 1946 up to 27,776 tons. The table on the previous page lists the allocations to various consumers in long tons.

The existence of more than one government stockpile of tin in the U. S. offers several possibilities in analyzing the exact wisdom of present policies of the CPA in releasing government tin reserves. From the standpoint of the tin producers, 12,000 long tons of U. S. Treasury and Navy reserve stocks which the CPA regards as not available for allocation are nevertheless accountable as tin tonnage available to the U. S. for a quite temporary and emergency situation. The data of the official organ of the Tin Producers' Assn. *Tin* therefore include this figure. When the CPA makes an exposition on the tin supply it counts only the tin which is available to its own organization for allocation.

According to CPA figures, if America proceeds in its second quarter, 1946, policy of consuming

tin reserves, stockpiles will be exhausted by June of 1947. The tin miners on the other hand point to the fact that in prewar years government policies on tin stocks consistently permitted stockpiles of less than 10,000 tons, and that today's reserves are unnecessarily large—certainly for the next year or two.

Despite the discouraging production picture in the first half of 1946, there is still a general optimism among the mining companies for 1947 and 1948. Opinion in the industry is that the British Colonial Office estimates production of metallic tin in Malaya for 1947 of 46,000 tons, 1948—72,000 tons, and 1949—73,000 tons are conservative. Such long range forecasts of expected Dutch East Indies production are not available, but official Dutch sources are of the opinion that progress in those areas will be at least as rapid as in Malaya. Sources here predict a total 1946 tin production of approximately 90,000 long tons of metallic tin against a 1935 and 1936 world consumption of about 155,000 long tons per year.

agricultural tractor of the "Zetor" type which is being turned out in two models. Textile machinery, which used to be largely imported from Germany, figures prominently in the production program and one of their latest lines is the "Zedina" sewing machine. Later on they will be producing typewriters with a 46-letter keyboard, while the output of other office machinery is steadily increasing. Other items included in the program are an all-purpose electric machine tool, electric hand drills, and new types of domestic machinery. They will also manufacture refrigerators, milk churns, automatic weighing machines, bicycles of three different types, and various appliances for physical and chemical research.

The products of the Ogar and Jawa motorcycle factories fall under the peacetime program of the Brno National Armament Works as these factories were annexed to the works under the nationalization program.

Coal Board Prepares To Take British Mines

London

• • • The British National Coal Board, under the chairmanship of Lord Hyndley, has now assumed office but will not take over the industry until the vesting date which will be fixed by the Minister of Fuel and Power.

A poster signed by Lord Hyndley has been sent to every coal mine and branches of the National Union of Mineworkers explaining the position and stating that in the interval before the board takes over it is "confident that it can rely on all concerned to work together for increased production and in industrial harmony, so that foundations may be well and truly laid and the industry may pass to the nation on the vesting date united in purpose and worthy of its responsibilities."

The other members of the board are Sir Arthur Street, deputy chairman; Sir Charles Ellis, scientific director; Sir Charles Reid and T. E. B. Young, production directors; Sir Walter Citrine and Ebby Edwards, labor directors; L. H. H. Lowe, finance director; and J. C. Gridley, marketing director.

Czechs Nationalize Auto and Aircraft Production, Repair

London

• • • Two new organizations, the National Automobile Works and the National Aircraft Works, have been established in Czechoslovakia to handle production and repair of aircraft and vehicles of all kinds, as well as aircraft engines, automobile engines, and stationary motors. Both national concerns will be under the control of the central organization for the metalworking and machinery industry.

In the National Automobile Works the state takes over the property and equipment of the firms "Asap," "Avia," Ing. J. Mraz of Chocen (coachwork aircraft and refrigerators), the Zlin aircraft works, the first North Bohemian aircraft factory, Ing. Ph. Petera & Sons, manufacturers of coachwork and vehicles, together with the Skoda Works' sales rooms and automobile repair shops, including both buildings and mechanical equipment at Moravska Ostrava, Ceske Budejovice, Mlada Boleslav, Uherske Hradiste and Kunovice.

The establishment of the National Aircraft Works involves the nationalization of the firms Aero, Rudy Letov Joint-Stock Co. Walter, and of the various works of Ceskomoravska, their motor manufacturing and repair shops at Prague-Karlin, their automobile and aircraft works at Prague-Liben, Prague-Vysocany, Kbely and Malešice, as well as their automobile repair shops at Hradec Kralove, Brno, Moravska Ostrava and Uherske Hradiste.

Czech Arms Plant To Make Several Lines Of Peacetime Machinery

London

• • • The Brno National Armament Works in Czechoslovakia are now producing articles which will, according to the economic bulletin of the Czechoslovak Ministry of Foreign Trade, contribute greatly toward the industrial and agricultural reconstruction of Czechoslovakia and help the country to compete in foreign markets.

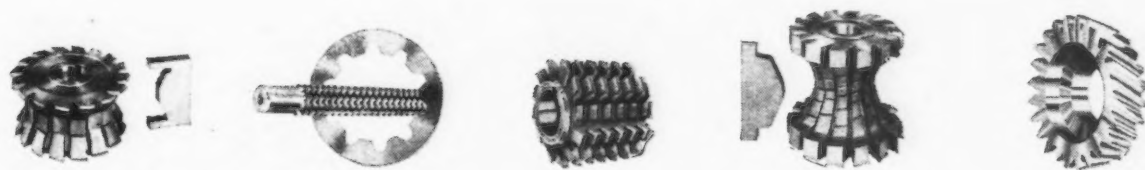
One of the more important of their peacetime products is the



Reduce Part Costs

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HEADQUARTERS FOR ENGINEERED CUTTING TOOLS

ILLINOIS

TOOL WORKS

MANUFACTURERS OF METAL CUTTING TOOLS AND SHAKEPROOF PRODUCTS



2501 N. Keeler Avenue, Chicago 39, Illinois
In Canada: Canada Illinois Tools, Ltd., Toronto, Ontario

PERSONALS

• • •

• **Herbert S. Boring** has been appointed comptroller in charge of accounting and finance, Portsmouth Steel Corp., Portsmouth, Ohio. He was formerly comptroller of Van der Horst Corp. of America.

• **S. Floyd Stewart** has been elected to the board of directors of the Leece-Neville Co., Cleveland. He joined Leece-Neville as a research engineer 10 yr ago, becoming chief engineer in 1941, and vice-president in charge of engineering last December.

• **Richard C. Crouch** has been elected a member of the board of directors of Acme Aluminum Alloys, Inc., Dayton. Prior to joining the Acme organization in March of this year as comptroller, he served 3 yr in the Navy. Mr. Crouch also has been appointed secretary and treasurer of the company, filling the vacancy created by the resignation, after 17 yr association, of **William C. Lewis** as secretary, treasurer, and director of the company to enter business for himself.

RICHARD C. CROUCH, secretary, treasurer, and member of the board of directors, Acme Aluminum Alloys, Inc.



• **Frank V. Lockefer** has been appointed general sales manager of Mid-States Equipment Corp., Chicago. He was formerly a sales executive with Rit Products, Inc., for 8 yr.

• **Bernard J. Meldrum** has been appointed chief engineer at the Chrysler Corp.'s Dodge Main plant, engineering dept., Detroit, and **Edward H. Stilwill** has been made chief contact metallurgist. **John E. Brennan** and **Jerry M. Gruitch** have been assigned as engineers on Mr. Meldrum's staff. Mr. Meldrum has served as laboratory engineer and as assistant department head in the mechanical laboratory of Central Engineering. He will direct all phases of product engineering at the Dodge plant, succeeding **George B. Allen**, who has been transferred to the general experimental staff of the Engineering Div. As chief contact metallurgist, Mr. Stilwill will direct the metallurgical contact work for ferrous metals purchasing and processing at the Dodge Main, Dodge Forge and Newcastle plants. Since 1937 he has been on the metallurgist staff of Central Engineering as supervising metallurgist on production contact operations.

• **Forest S. Burtch** has been promoted to manager of sales, Wire Rope Div., and **William Hobbs, Jr.** has been named manager of sales, Aircord Div. of John A. Roebling's Sons Co., Trenton, N. J. Mr. Burtch joined the staff of the Roebling Wire Rope Engineering Div. in 1923, and from 1943 until his recent appointment, has been manager of sales for the Aircord Div. He succeeds **Earl N. Graf**, recently resigned. Mr. Hobbs has been a member of the Roebling engineering staff since 1934.

• **Gordon Rieley**, vice-president, Bryant Heater Co., Cleveland, has been appointed manager of the company's new plant in Tyler, Tex.

• **John E. Lynch**, for 14 yr manager of the Cincinnati sales office of Cincinnati Milling & Grinding Machines, Inc., has been named manager of the New York office. **Carl M. Beach** has been chosen to manage the Detroit office, **E. F. Render** has been moved from Syracuse to Detroit, and from the factory, **W. Kent Mathias** to the Syracuse office.

• **Wilfred G. Cryderman** and **Howard L. Wright** have been appointed sales representatives of the Hanson-Van Winkle-Munning Co., Matawan, N. J. Mr. Cryderman's previous business connection was with the Cleveland office of Westinghouse Electric Corp. He has been assigned to the Dayton office of the H-VW-M Co. Mr. Wright, who was recently discharged from the U. S. Navy, has been assigned to the Philadelphia office of the company.

• **Harold S. Hoover** has been appointed director of public relations of the Upson Co., Lockport, N. Y. He had previously been associated with the Manufacturing Div. of the Crosley Corp. and with the General Tire & Rubber Co.

• **Peter L. Smith**, superintendent of maintenance of the Winchester Repeating Arms Co., division of Olin Industries, Inc., New Haven, Conn., has retired after 42 yr of service.

• **E. C. Brehm**, formerly Chicago district manager, has been named district manager of the Pacific Coast territory of the Carbone Corp. with offices in San Francisco. **R. B. Lamkin** has been appointed district manager of the Chicago office. He was formerly with the signal dept., Pennsylvania Railroad.

• **Bernard L. Bray** has been appointed sales manager of the Marine Equipment Div. of Ellinwood Industries, Los Angeles, replacing **Philip F. Shepherd**.

• **Clifford A. Patch** has been appointed sales manager, Western Div. of Joshua Hendy Iron Works, Sunnyvale, Calif., succeeding **Clarence Jensky**, resigned. Mr. Patch has been successively assistant chief engineer, turbine sales manager, and chief project engineer at Hendy.

• **William A. Blees**, vice-president in charge of sales for Consolidated Vultee Aircraft Corp., San Diego, has been elected to the board of directors. Mr. Blees joined the company after resigning as vice-president of Young & Rubicam, Inc. He was formerly vice-president in charge of sales for the Buick, Oldsmobile, Pontiac Sales Co. Div. of General Motors Corp., and general sales manager of Nash Motors Nash-Kelvinator Corp.

PERSONALS



ED J. TOWEY, sales manager, Industrial Div., Adel Precision Products Corp.

• **Ed J. Towey** has been appointed sales manager of the Industrial Div. of Adel Precision Products Corp., Burbank, Calif. He was formerly executive vice-president in charge of sales, engineering, advertising and development of new products for the Diamond Iron Works of Minneapolis.

• **William P. Husband, Jr.**, president and treasurer of the Ashton Valve Co., Cambridge, Mass., has been elected to similar positions by the Crosby Steam Gage & Valve Co., Boston.

• **Forrest W. Morrow** has been appointed superintendent of the galvanizing dept. of the American Rolling Mill Co.'s east works plant in Middletown, Ohio. He succeeds **D. O. Fisher**, who has retired. Mr. Morrow joined Armco in 1928. In 1945, he was made assistant superintendent of the galvanizing dept., which position he has held until this recent appointment.

• **Harold T. Youngren** has been appointed director of engineering and **Lewis D. Crusoe** has become a member of the executive staff of the Ford Motor Co., Dearborn, Mich. Mr. Youngren was formerly chief of engineering development of Borg-Warner Corp. For the past 8 months Mr. Crusoe has been assistant to Ernest R. Breech, executive vice-president of Ford Motor Co.

• **William B. Guernsey** has been named assistant to the vice-president of American Bridge Co., Pittsburgh, U. S. Steel subsidiary. **Craig T. Capp** has been appointed marine dept. contracting manager succeeding Mr. Guernsey. Mr. Guernsey began with American Bridge in 1925 as a draftsman and became assistant contracting manager of the marine dept. in 1939. Two years later, he was appointed contracting manager. Mr. Capp also began with American Bridge as a draftsman at the Ambridge, Pa. plant in 1937. Two years later, he was transferred to the marine dept. as an engineer and in 1943, he became assistant contracting manager.

• **E. O. Brady** has been named general manager of Briggs Mfg. Co.'s Plumbingware Div., Detroit, succeeding the late Richard B. Jenkins. Mr. Brady has been general sales manager of the division since 1944. **Roy Blasiola** has been named assistant manufacturing manager of the company.

• **Harold R. Dinges** has been named district sales manager of one of the new southern sales areas of the Mathieson Alkali Works, New York, and will direct its activities from headquarters at Charlotte, N. C. A member of the company's sales development dept. until his present appointment, Mr. Dinges joined Mathieson in 1941. He will supervise company sales activities in Virginia, North and South Carolina and parts of West Virginia and Tennessee. **O. J. Theobald, Jr.**, a member of the Mathieson organization since 1932 as sales representative, has been named to assist Mr. Dinges. **Fred O. Tilson**, district sales manager of the second newly defined southern area which will be serviced from Chattanooga, Tenn., will supervise company sales activities in parts of Tennessee, Alabama and Georgia. Prior to his new appointment, Mr. Tilson has represented Mathieson in varied sales capacities since joining the company in 1925. **William H. Eastburn** heads the newly defined New England sales area as district sales manager and will direct sales activities from headquarters at Providence. He has been a member of Mathieson's sales staff since 1932.

• **R. L. Hess, Jr.** has been named secretary of the Rust Engineering Co., Pittsburgh, and will also direct the activities of the legal dept. Mr. Hess, who had been serving as assistant secretary and assistant treasurer of the company, succeeds the late **Ralph B. Baldrige** in his new position. **Dickson C. Shaw, III**, an attorney in the legal dept., will take Mr. Hess' position as assistant secretary.

• **Gordon Appleby** has joined the welding engineering staff of Lincoln Electric Co.'s Philadelphia branch office. **Terril S. Hoffman** has been named welding engineer in the St. Louis area, and **E. James Langhurst**, welding engineer in the Chicago territory.

• **Ellis P. Mason** has joined the staff of A. Finkl & Sons Co. as district manager for their new branch office located at Louisville. He was formerly with the Dodge Chicago plants of the Chrysler Corp.

• **Robert W. Ward** has been elected a vice-president of American Car & Foundry Co., New York, and placed in charge of manufacturing. He was previously district manager of the ACF Huntington, W. Va. plant. **W. E. Lunger**, general superintendent of the Huntington plant, has been appointed district manager of that plant.

ROBERT W. WARD, vice-president in charge of manufacturing, American Car & Foundry Co.



• **Warren H. Williams** has been appointed assistant district sales manager of the Detroit office, Inland Steel Co. Mr. Williams has been with Inland since 1937, and has been a member of the Detroit sales staff during the entire period. Prior to joining Inland, he had been with the Newton Steel Co. having started there in 1926.

• **A. C. Brown, Jr.** has been appointed manager of Air Reduction Sales Co.'s Cleveland district succeeding S. H. Newborn. Recently returned after 5 yr in the Army, Mr. Brown started with Air Reduction in 1935. Before entering service, he served as salesman, and later as branch manager at Grand Rapids.

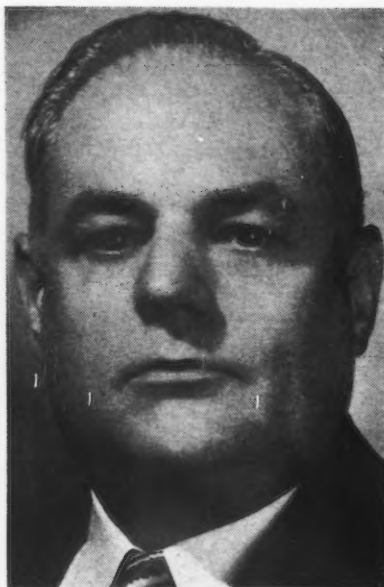
• **J. E. Murphy** has been named manager of distributor sales for the Parker Appliance Co., Cleveland. Prior to joining Parker in 1943 as a sales representative in the Dallas territory, Mr. Murphy was associated for 6 yr with the Dow Chemical Co. **D. A. Cameron** has been appointed assistant general sales manager of the company. He joined Parker in 1941.

• **Harold C. Conners** and **Harold R. Fosnot** have been named by the Graver Tank & Mfg. Co. to head the firm's Chicago area sales activities. Both war veterans, Mr. Conners will handle steel plate sales while Mr. Fosnot will represent the Graver Process Equipment Div.

• **Creston E. Kite**, who became associated with General Alloys Co. in January in the capacity of assistant to the president, has been elected vice-president in charge of sales. Mr. Kite was formerly a sales executive with the E. F. Houghton Co., Eastern district.

• **Richard T. Nalle**, executive vice-president of the Midvale Co., has been elected to the board of directors of the Pennsylvania Salt Mfg. Co., Philadelphia.

• **H. K. Tryon**, who has been associated with Lukens Steel Co. since 1937, has been appointed a member of the sales staff of the newly opened Cleveland office of Lukens and subsidiary, By-Products Steel Corp. He will make his headquarters in the office at Cleveland.



C. W. HAGENBUCH, assistant vice-president, Sheffield Steel Corp.

• **C. W. Hagenbuch** has been appointed assistant vice-president of the Sheffield Steel Corp., Kansas City. He has been associated with Sheffield for 26 yr. His first position was plant efficiency engineer. He has since served progressively as head of the cost accounting dept., in the development and sales of products, as office manager and production manager, and manager of grinding media.

• **Howard B. Johnson** has been elected vice-president of the Atlantic Steel Co., Atlanta. **R. S. Lynch** has been elected vice-president and general superintendent; **Gilbert Purvis**, treasurer; and **W. F. Glenn**, assistant secretary. **C. F. Williams** has been named general sales manager.

• **Dwight L. Davidson** has been appointed products account supervisor of the American Steel & Wire Co., Cleveland. Mr. Davidson started with the wire company in 1941 as staff auditor and was employed in the Cleveland office.

• **Maxim Konecky**, former vice-president in charge of sales of William Primm, Inc., has been appointed vice-president in charge of sales of Smith-Victory Corp., Buffalo, and **Heimut R. Katzman**, formerly with the Curtiss-Wright Corp. as production manager, factory manager and plant superintendent, has been named production manager of Smith-Victory.

• **Edward J. Zschirpe**, **John H. Norwood** and **Arthur E. Baylis** have been appointed assistant general freight traffic managers of the New York Central System, with headquarters in New York. Mr. Zschirpe was assistant to vice-president, freight traffic, now retired. Mr. Norwood was assistant general freight traffic manager at Cincinnati. Mr. Baylis, who was appointed foreign freight traffic manager in 1944, will continue general supervision over that department.

• **Milton M. Zelter** has been appointed sales manager of the Robeson Cutlery Co., Perry, N. Y. Mr. Zelter recently joined the Robeson Cutlery Co. after serving 42 months with the AAF's Air Transport Command.

• **Harry H. Williams** has been appointed manager of advertising service of the B. F. Goodrich Co., Akron, Ohio. He has been with the company 3 yr.

OBITUARY...

• **George W. Davey**, 57, general superintendent of Riley Stoker Corp., Worcester, Mass., died suddenly July 17.

• **Frank S. Fletcher**, 83, died recently in Detroit. He was an employee of Clayton & Lambert Mfg. Co., Dearborn, Mich., for 30 yr.

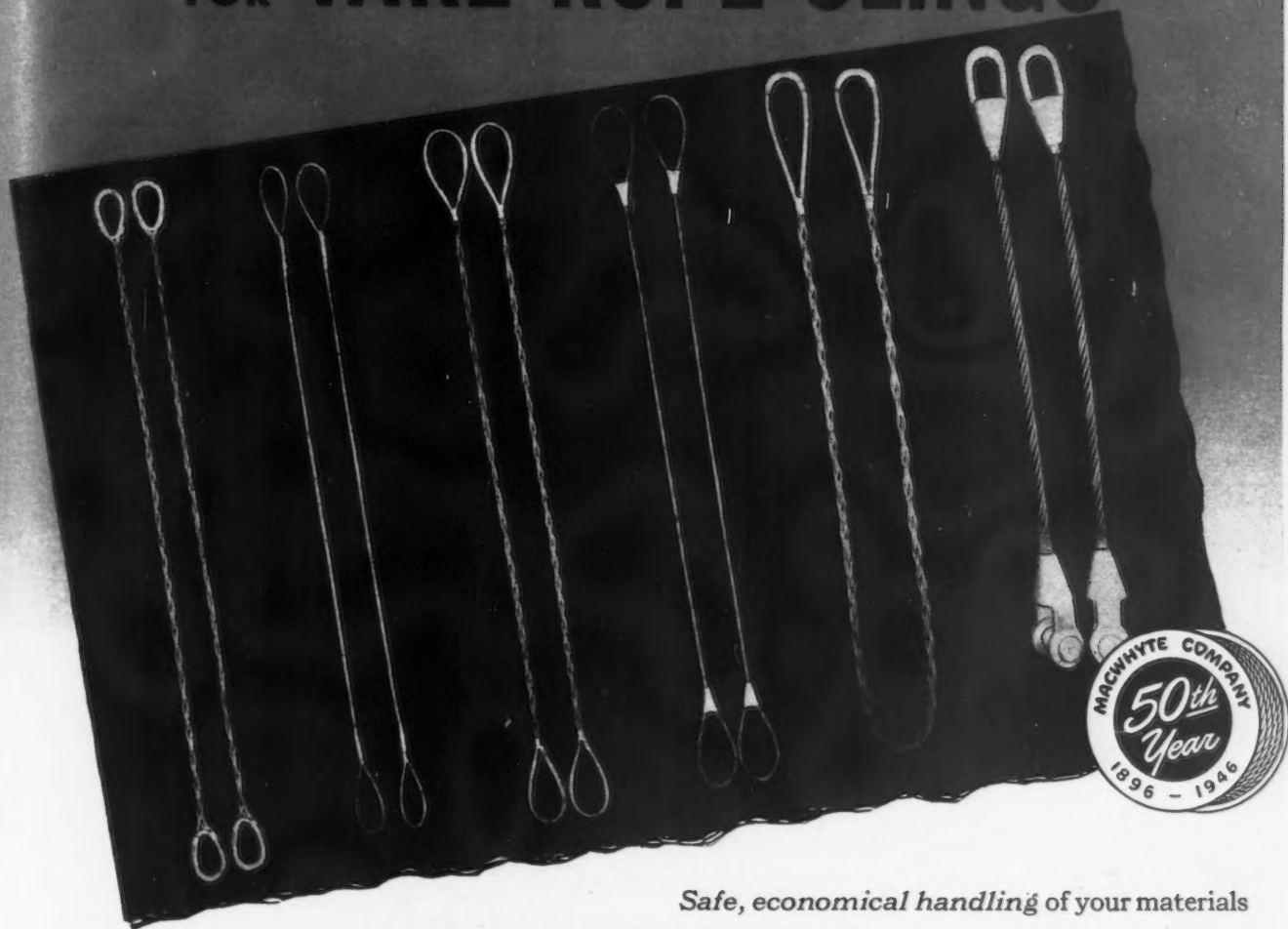
• **Richard B. Jenkins**, general manager of the Plumbingware Div. of Briggs Mfg. Co., Detroit, died recently.

• **John W. Peterson**, automobile designer, died recently at his home in South Bend, Ind. He began his automotive career in 1900, and was associated with Peerless Motors, Hupmobile Co., General Automobile Co. and the King Motor Co.

• **Anson K. Bradley**, associated with the Morgan Construction Co., Worcester, Mass., since 1906, died July 17 following a brief illness.

• **Mark B. Speer**, president of M. B. Speer & Co., Inc., Pittsburgh, died July 17.

MAKE **MACWHYTE** YOUR HEADQUARTERS FOR **WIRE ROPE SLINGS**



Safe, economical handling of your materials calls for Macwhyte Slings. These flexible, easy-to-use slings save you time and labor on the job. They cut your unit handling costs, help production.

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...yours for the asking. Shows many safe ways of rigging up. Lists Macwhyte's complete line. Gives other useful pointers. Call your nearest Macwhyte representative, or mail request to Macwhyte Company. Ask for Catalogs S-7 and 44-1.

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Engine Council



Dear Editor:

PIN POINT LIGHT SOURCE

Sir:

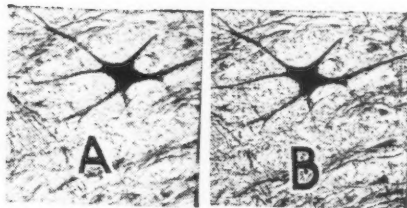
I have read with much interest the item on p. 54, Apr. 25 issue, concerning the pin point light source. The statement that "the new lamp makes possible greater magnifications than has been considered possible, without the aid of an electron microscope," does not seem to be in accordance with the generally accepted theory that the limit of magnification of an optical microscope is set by the resolving power of its objective. The lack of brilliancy of a light source has never been a serious obstacle in this respect. I would be pleased to have the authors' comments on this point.

As a regular subscriber I take this opportunity to express my gratitude to yourself and to everybody contributing to the fine work of compiling such a wonderful periodical. We have been missing your publication during the war and are very glad to get it again regularly. My personal copy goes through many hands and THE IRON AGE is considered to be the best existing magazine of its kind.

N. G. NEUWEILER
Consulting Engineer

Geneva
Switzerland

● W. D. Buckingham, Electronics Div., Western Union Telegraph Co., Water Mill, Long Island, N. Y., one of the developers of the lamp, had this comment on reader Neuweiler's question: "The diameter of the luminescent source in concentrated-arc lamps is very small, ranging from 0.003 in. in a 2-w lamp to only 0.06 in. in a 100-w lamp. When these small source lamps are used in optical systems such as microscopes, photomicrographic equipment, etc., the light



source acts as a stop or diaphragm of the system. Thus the device produces very sharp images, with little scattered light and great depth of focus such as would be produced if the lenses were stopped down to an extremely small aperture but without loss of light that would ordinarily result. With this increased detail it is possible to use higher magnifications. The accompanying photomicrographs illustrate this difference. Illustration A (a nerve cell at 450X) was taken with a 30-w tungsten filament lamp; illustration B was taken with a 25-w concentrated-arc lamp substituted for the tungsten lamp."

—Ed.

ASPECTS OF MACHINABILITY

Sir:

I would like to obtain a couple of reprints of an article entitled "Metalurgical Aspects of Machinability" by F. J. Robbins, which ran in your Mar. 21 and 28 issues this year.

PETER A. HASSELL
Application Engineer

Electronic Devices Section
Allis-Chalmers Mfg. Co.
Milwaukee

● Reprints of this article have not been made, but we are forwarding you tear sheets with our compliments.—Ed.

MARTEMPERING

Sir:

We are anxious to obtain reprints of articles published in past issues which discuss the process of heat treating known as "Martempering." We should greatly appreciate any aid from you in this matter.

J. L. KLEIN
Director of Research

Jessop Steel Co.
Washington, Pa.

● A two-part article entitled "Martempering" was published in the issues of Jan. 28 and Feb. 4, 1943. A reprint of this article is being mailed you.—Ed.

COMPARABLE TOOL STEELS

Sir:

Enclosed please find 30¢ for which you will please send me two copies of "Chart of Comparable Tool Steels."

T. G. HARVEY
Metallurgical Engineer

Monarch Steel Co.
Indianapolis 7

ELECTRIC ARC HEATING

Sir:

We will be much obliged if you will kindly send us a copy of THE IRON AGE issue of Feb. 11, 1943. In case this is not available, would it be possible to let us have a copy of the article entitled "Electric Arc Hot Topping" by George F. Sullivan.

FRED. R. OSTHEIMER

Michelin Realty Corp.
New York 17

REMOVING BROKEN DRILLS

Sir:

Could you please send me the article "Removing Broken Drills with Arc Welding Technique," which appeared in THE IRON AGE magazine in the Sept. 24, 1942 issue on p. 58.

ALBERT SPAAK

95 Lincoln Ave.
Little Falls, N. J.

GRAMMAR LESSON

Sir:

In June 13 issue, p. 56, third line from bottom, principle should be *principal*. Why do you not learn to spell? In general "cancelation" is spelled with one "l" in the U. S. and with two "l's" in England. Rule: The consonant is doubled if the last syllable is short and carries the accent, as in forgetting.

W. TRINKS

Ohioypyle, Pa.

● On principal, you are correct, reader Trinks, but our Webster's Unabridged still insists on two l's in cancellation.—Ed.

DECARBURIZATION IN STEELS

Sir:

I would appreciate receiving a copy of the article on "Decarburization in Highly Stressed Steels" by P. A. Haythorne.

F. R. MORRAL
Metal Trades Laboratory
Technical Service & Development Div.
American Cyanamid Co.
Stamford, Conn.

SHOT AND GRIT STANDARDS

Sir:

Would it be possible for you to furnish us a copy of shot and grit specifications as published in the issue of Sept. 13, 1945?

S. FRED SMITH
Assistant Purchasing Agent
Draper Corp.
Hopedale, Mass.

REMOVING SAND AND SCALE

Sir:

Will you please send us the article on "Removing Sand and Scale From Gray Iron Castings" found in the May 16 issue, p. 51.

T. C. MCKENZIE
President

Klem Chemical Works
Dearborn, Mich.

TOOL STEEL HEAT TREATMENT

Sir:

It will be greatly appreciated if you could forward five copies of the article "Practical Tool Room Heat Treatment" by F. J. McMulkin. This article appeared in the June 6 issue.

H. F. EISENGREIN
Plant Engineer

Steel & Tubes Div.
Republic Steel Corp.
Brooklyn

● To fill the heavy demand for additional copies of this 24-page, five-part up-to-date discussion of practical tool room heat treatment, we have prepared reprints which are available to readers at 50¢ a copy.—Ed.

382 LBS. OF CONNECTING ROD Forged BY T & W TO COST LESS AT THE POINT OF ASSEMBLY

This is the set of dies used for drawing and shaping the stock in the first forging operation. With these dies the proper proportions of metal required for each part of the connecting rod are obtained.

The steel stock from which this unusually large connecting rod is forged is 31½ inches long by 12 inches wide and 6 inches thick. Drawing and shaping, so as to provide the correct proportion of stock required for various sections of the completed connecting rod, is performed in the first forging operation.

Further refinement and shaping of the metal is done in this set of closed impression dies where the hot metal is given additional shaping and is then worked in the semi-finishing or blocking impression. This blocking or semi-finishing requires several blows to force the hot metal to flow into and completely fill the impressions of the connecting rod that have previously been sunk in the dies. After this operation, the forging is punched before proceeding to the final forging or finishing operation.

In this set of die blocks the finishing impression forms the connecting rod to its exact dimensions and to close tolerances. This work requires several successive blows in the finishing dies, and requires exercise of the utmost care and skill on the part of the forging craftsman. The flash, or excess metal, around the edge of the forging when it comes from the dies, is trimmed off in a set of trimmer dies installed in a mechanical press. During this operation the inside of the crankshaft end of the forging is punched out.

A wide range of sizes of connecting rods weighing from 1/2 lb. to over 600 lbs. is forged by T & W. All are forged to close tolerances and require a minimum of machining and finishing. Ask a T & W Forging Engineer to show you how to obtain forgings that cost less at the point of assembly.



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This Industrial Week . . .

- **Steel Prices Unaffected by New OPA**
- **CPA to Reinstitute Priority Ratings**
- **Car Shortage To Be Worst in History**

CONGRESS last week attempted to harness inflation with a modified OPA, but the basic changes in OPA's form, which allows substantial and widespread price increases in certain fields, may prove the breach that will open the floodgates. Except where specific price increases were granted when the new OPA was inaugurated, the technique of obtaining price relief still consists of trekking to Washington with cost figures and battling to prove those figures. Steel prices must await another proving period, but pig iron, machinery, and many other items in the metalworking field were handed long-sought higher prices.

The \$2 a ton increase in pig iron is just about 66 pct of what the industry sought before the old OPA ceased. As a matter of fact, had OPA stayed a corpse, the increase would probably have been in the neighborhood of \$3.50 a ton. The \$2 a ton increase does not seem to be attractive enough to bring into blast very many of the furnaces now out of operation because of price. CPA had hopes that these units would go back into operation, evidenced by recent statements to the effect that attempts would be made for iron production from now dormant furnaces. However, only time—and coke availability—will tell.

The rebirth of OPA has quieted the consistent rumors that steel prices were about to be increased and has successfully rolled back the prices of those items that were advanced on producer levels rather than industry levels. Enjoying a brief price advance were track bolts and screw spikes, advanced beyond the 12 pct by one producer, and sheet bars, advanced \$7 a ton by one producer. These prices, with the new OPA, must be rolled back to OPA ceilings and application through established channels made for price relief.

THAT the steel industry will seek higher steel prices is nearly a foregone conclusion, despite recent statements to the contrary. Many industry and individual requests for increased prices existing before the old OPA ceased will be renewed with vigor as soon as the required data can be obtained. Price increase requests will most likely be on a product basis rather than on a general basis, and an overhauling of the extra system to bring it out of obsolescence is likely.

While OPA was getting itself reorganized, CPA opened with its heavy guns and stated that CC and MM priorities would be reinstituted soon to provide priority assistance for attainment of satisfactory production rates, especially where significant tonnages have been obtained without priority assistance and where only a small amount of help is needed for spe-

cial items. CC and MM ratings, which were suspended Jan. 21, 1946, when the steel strike started, will probably not account for a very great percentage of the total steel output, but what it may do to specific mill schedules is hard to tell—especially when superimposed on the already existing certification system for farm machinery and housing. Some 200,000 tons will be pegged for fourth quarter housing and farm machinery, of which about 150,000 tons will be already highly critical flat-rolled items.

The worst shortage of box cars ever experienced is the prediction for the week. Already various districts of the country report actual curtailment of steel-making operations because of this shortage. Chicago reports 7500 tons of steel production were lost, and consumers of such items as tin plate are accepting motor truck shipments with their higher delivery costs. Mills have both steel and scrap piled up awaiting cars, and the extended use of truck deliveries is running up delivery costs. With the loss of about 75,000 box cars during the war, and with about a third of the present 665,000 in operation in need of repairs, the shortage is expected to exist for some time. The same pattern follows with types of rolling stock other than box cars.

SCRAP, likewise, is taking its toll in steel ingot output. Openhearthers in at least two major producing areas have been taken out of production because of the scrap shortage. However, dealers are now actively trying to move scrap as they suspect that any quantities of scrap held in speculation may start to be dumped. Further, production scrap is coming out in ever-increasing volume, and another month should see an end to the present scrap crisis. However, scrap in plentiful volume may not occur in the near future. Along with the scrap shortage and ranking a close second is the coal and coke shortage. Blowing in of blast furnaces has been held up because of the fuel shortage, but it is expected that the situation will reverse itself by late Fall.

For the second week in succession the steel industry, despite car, scrap, and coke shortages, maintained steel ingot production at 90.5 pct of capacity. This rate is well above the optimum operating rate of the industry, and many individual producers are producing at above 100 pct. While mindful of the possibility of curtailments facing the industry, ingenuity, and the possibility that all is not as black as it looks have held the steelmaking rate at a remarkably high level. Digging into reserve scrap piles may cost production during the coming winter months, but actually mills are draining what reserves have been accumulated far faster than scrap is being stocked.

• **PIPE LINE**—Standard Oil Co. of Indiana has let contracts for a pipe line to carry finished products which will run from Whiting, Ind., to Minneapolis with the terminal point at Morehead, S. D. The line is 10 and 8-in. diam, and will require about 47,000 tons of steel. Most of the pipe tonnage has been placed with National Tube and Republic Steel Corp.

• **IMPROVEMENTS**—With the principal item to be the construction of a new rod mill, Laclede Steel Co. has embarked on an expansion program. Stockholders of the company recently approved the issuance of a 2,500,000 promissory 3 pct note to the Prudential Life Insurance Co.

• **FISHING BOATS FOR FRANCE**—French government, acting through the French Supply Council, has contracted with the Bath Iron Works, Bath, Maine, for 32 modern fishing trawlers to surpass in power, and in some cases, size, any trawler now sailing out of Boston, Gloucester and New Bedford. Engines for the boats, 1320 hp diesels, will be manufactured in Denmark. Gears necessary to outfit the craft will be bought from American firms.

• **CZECHOSLOVAKIAN STEEL OUTPUT**—"Zahranicni Obchod" states that in spite of all difficulties, particularly in regard to coke supplies, the Czechoslovakian production of raw steel is being maintained at a satisfactory level. Some products are being produced in such quantity that the quota system for them can be abandoned, e. g., nails.

• **SOVIET TRANSPORT ROUTES**—Occupation authorities of the Soviet zone in Germany now permit the Czechoslovak railways to run one train daily by the Podmokly-Dresden-Magdeburg-Halmstadt route. This will be used for transporting motor spirit and empty tank trucks to and from Hamburg. Permission has also been given for the use of Stralsund harbor, and two trains daily are running between Stralsund and Czechoslovakia via Berlin, Dresden, and Podmokly. This route will be used mainly for transporting ore from Sweden.

• **HERMAN GOERING WORKS**—The Linz, Austria, works, now called the United Iron and Steel Works, which employed nearly 17,000 workers during the war and produced over 1,000,000 tons of steel a year, have now been turned over to the Austrian government by the Americans.

• **REPORT KILLED**—CPA has discontinued its reporting form required of metalworking establishments in one form or another since 1941. The form, CPA-372, covered metals inventory, plant operations and employment in plants engaged in metal fabrication operations. At one time, the form reached as many as 25,000 respondents. As small plants and users of metal in small quantities were eliminated, coverage was gradually reduced until, from June, 1944, on, only 8000 plants were regularly covered.

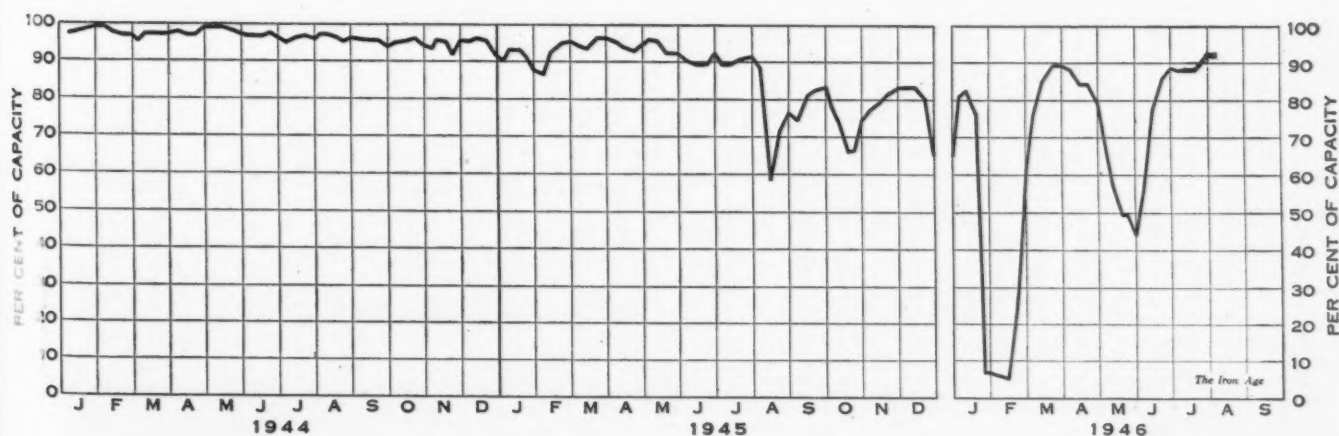
• **GERMAN FOUNDRY STRIKE**—The first strike, in the North Rhine region since the war, occurred recently in two iron foundries at Velbert, between Dusseldorf and Essen. Reduction in working hours since March resulted in lower earnings, and an increase of one and a half marks a day was demanded by the workers. Management pointed out that the existing pay rates were laid down by the labor office and the managements had no power to grant increases. The men went back to their places in the foundries, but no work was done for two days. Finally the British industrial relations branch intervened and the men agreed to end the strike, having gained nothing.

• **SINTERING PLANT**—WAA is offering for sale or lease a government-owned iron ore concentrating and sintering plant with a 1 million gross ton annual capacity, located near the village of Star Lake, N. Y., subject to the rights of the wartime lessee, the Jones & Laughlin Ore Co. Built at a reported cost of \$6,996,532, the property is readily convertible to peacetime production, WAA said.

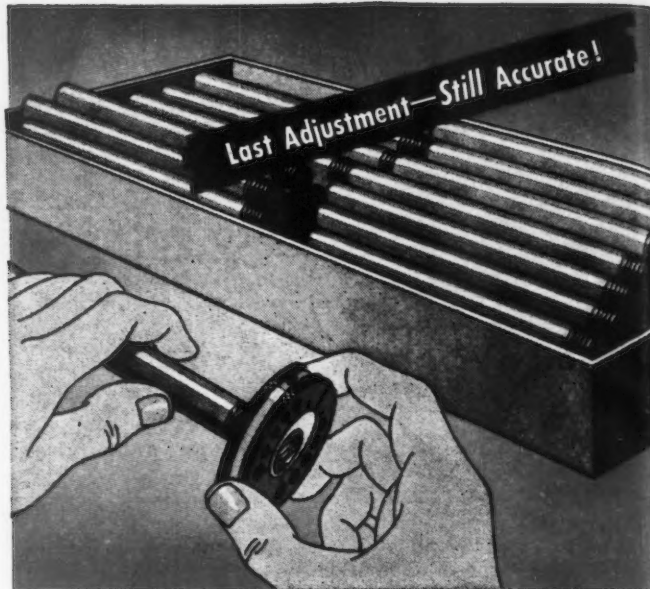
• **MACHINE TOOL ORDERS**—Study of possible purchases in this country by Great Britain with funds made available by the British loan indicates that British purchases in this country probably will reach \$1 billion by the end of this year and will continue annually at nearly \$1 billion through 1948. Orders for machine tools, including heavy presses, are expected to exceed \$16 million annually. Machinery purchases currently are at the rate of about \$36 million and are expected to exceed an annual rate of \$120 million.

• **MEXICAN INDUSTRY**—Shipment of machinery for the new steel shipping container and water and space heater plant near Mexico City is about under way. Production of these items for the Mexican market is scheduled for sometime during the third quarter of this year. The plant is being built at Tlalnepantla, near Mexico City.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheating	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
July 16.....	98.5	91.0	91.0	87.0	93.5	102.0	94.0	99.0	100.5	61.0	94.5	60.0	84.0	90.5
July 23.....	99.0	90.0	87.5	87.0	93.0	102.0	94.0	99.0	101.0	60.0	101.5	55.5	83.0	92.5



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OPA's Rebirth Marked by General Price Increases

Washington

• • • Restored to life by Congress after a 25-day suspension, OPA operating under a modified law has been working feverishly since July 26, in a huge backlog business of issuing hundreds of orders covering price increases, suspensions and adjustments. Invariably price increases were based on increased materials and wage costs.

Delayed action on pig iron, long under consideration, developed an order on July 27 increasing prices \$2 per ton on all grades except charcoal, retroactive to May 29, when an adjustable pricing order was announced. At the same time OPA again declined to increase prices of scrap.

Action on price increases for iron and steel products awaits a study by the industry. Under the

revised law, price increases can be granted on the basis of 1940 costs, plus cost increases since that time resulting from higher wages, increased material costs, and other factors. To get the increase, the industry, through its Iron and Steel Industry Advisory Committee, will be required to present OPA comprehensive data in support of the petition. It is likely that the many individual and industry price requests made before OPA died on June 30, will be discarded by OPA and a complete new set of cost data requested to show justification for the increases. However, discarded or not, these price increase requests will form the basis for the requests for adjusted prices.

Put into effect July 27 was a price increase of 5 pct for bolts, nuts, screws and rivets, bringing

the total price boost to 12 pct by adding a 7 pct that had been granted on April 1. OPA had prepared this additional price increase shortly before it died on June 30, but delayed issuing the order because it was not scheduled to become effective until after that date.

Outstanding in the suspension orders was one covering a wide list of industrial machinery, whose annual sales exceed \$2 billion. Meanwhile, manufacturers of machine tools and other industrial equipment, who previously had been relieved of price control, were told to report any price changes they make.

Also suspended were prices on a list of nonferrous metals and on alloy castings, the latter at distributors levels. Producers prices had been previously decontrolled.

• • •

Pig Iron and Bolts Head List of Price Changes

Pig Iron—Prices of all grades, except charcoal, have been increased \$2 a ton, retroactive to May 29 when OPA issued an adjustable pricing order.

Bolts, Nuts, Screws and Rivets—Prices were increased by another 5 pct effective July 27. This increase is in addition to the 7 pct advance granted April 1 and was accomplished by revoking the previous increase and replacing it with a 12 pct advance. Resellers are authorized to pass on the additional producers' increase to consumers.

Insulating Firebrick: Manufacturers selling on a delivered price basis are permitted to increase ceilings by 20.1 pct. Those who sell on an f.o.b. plant basis are permitted to increase prices 21.6 pct. Both increases are effective July 26. Resellers can add to maximum prices the percentage amount of the increased cost except when prices are set by area pricing orders.

Standard Wire Nails and Fence Wire: Resale prices, effective July 26, are put under the same percentage of markup provisions govern-

ing reselling of other types of merchant wire products. Previously jobbers of standard wire nails, smooth annealed merchant quality wire, and smooth galvanized merchant quality wire have been on dollar-and-cent markups over costs. Jobbers will compute ceiling prices on the same basis used in pricing other types of nails, which provide alternative methods for carload lots and l.c.l., with varied provisions for computing prices in free delivery areas and sales outside free delivery areas.

Stock Screen Goods: To enable companies operating on a hardship basis to obtain relief without waiting for industry-wide action, manufacturers have been authorized to apply under hardship provisions for individual adjustment of ceiling prices, effective July 26.

Metal Stampings: The percentage amount of recent increases in manufacturers' ceiling prices for metal stampings may be passed on by resellers. Manufacturers increase granted in April, 1946, amounted to 19 pct.

Lead: An interim increase has

been granted of 1¾¢ per lb of primary lead contained in each gallon of 100 pct pure lead pigment paints, effective July 26. This action follows OPA's recent authorization to advance prices of lead pastes by the same amount. Resellers may pass on the percentage increase.

Machinery: An interim price increase factor of 8 pct over base date maximum sales prices for producers of grain machinery and equipment, effective July 26, has been made. Machinery affected includes all grain milling machinery or machinery used in the manufacture or processing of grains, cereals and feeds.

Oil Burners: Effective July 26, maximum prices for domestic oil burners may be increased by 5½ pct. This is the second increase since V-J Day and brings the price level to 15 pct above October, 1941, prices. Resellers are permitted to bring their maximum prices up to cover their percentage increase in costs.

Convactor Radiators: Ceilings are increased 10 pct over March,

1942, prices, effective July 26.

Hardware: Increases ranging 10 pct to 50 pct over June 30, 1946, ceiling prices are granted manufacturers and resellers of specified items of hardware, hinges and butt hinges, effective July 26.

Construction Machinery and Equipment: Sellers, who have been selling under interim price ceilings 10 pct above base prices in effect Oct. 1, 1941, may continue to sell at these price levels indefinitely. Previously, this interim increase was slated to end July 15, 1946.

Anti-Friction Bearings and Metal Balls Used in Anti-Friction Bearings: Effective July 29, prices were increased 10.5 pct for metal balls and 12 pct for anti-friction bearings over base date sales prices. Automotive bearings are not included, but forthcoming action will increase prices on these types. Resellers may increase their sales prices the same percentage amounts as their invoiced net costs have been increased.

Wire and cable: Manufacturers of wire and cable, except armored cable, may now revise their lists so as to include no more than the amount permitted by increases granted by OPA on June 3 and 4, 1946. Resellers who customarily sold off the manufacturer's list may continue to do so. OPA has also revoked its former requirement that manufacturers of wire and cable supply resellers with separate statements on invoices showing the amount of their price increases. Prices on wire and cable containing copper shields were boosted 1.10 pct.

Industrial Machinery and Equipment: Effective July 26, this second large suspension action for capital goods covers annual sales of more than \$2 billion. Major product lines affected are: Electrical equipment such as arc lamps, flood lighting equipment, highway lighting equipment and traffic signals; machine tools such as drills, grinders; engine, turret and special purpose lathes, and automatic milling and automatic chucking machines; specified petroleum drilling and producing machinery and equipment; mining and related machinery such as shuttle cars, mine loaders, pulverizers, and coal preparation machinery and equipment; automatic testing and maintenance equipment such as alinement machines,

brake drum gages and front end inspection and correction machines; farm equipment such as specified poultry farm equipment, beekeeper's machinery and supplies, and horsedrawn buggies.

Nonferrous Metals and Miscellaneous Metal Products: Effective July 26, items used for industrial purposes which represent only a small part of business costs are suspended. Amendment also suspends from price control high alloy steel castings at distributors level. These were previously suspended at producers level. Also, previous action suspending fabricated structural shapes or plates was extended to cover all bolted steel storage tanks (field erected), including those made of steel sheets as well as plates.

Other items covered by the action are: Bismuth metal and alloys, cadmium metal, cast brass type, railway car (including surface and subway) journal bearings subject to revised maximum price regulation No. 125, high alloy castings as defined in MPR 214, dowel bars for concrete pavings, expansion devices for concrete paving (iron or steel), highway traffic

guards (iron or steel), and ice cream cans (metal).

Also suspended were: Iron and steel engineered precision die, mold, pattern, and grinding plate castings, produced to close tolerances and fine finishes where no further machining is required except to match surfaces or parting lines, to chromium plate surfaces or to provide holes for guide pins; solid steel rivets, 1/2-in. diam and over, truck bolts, wire shoe nails, foundry facings (carbon base), graphite, graphite crucibles, stoppers, retorts and similar graphite products for use in foundries; industrial diamonds, and pyrites.

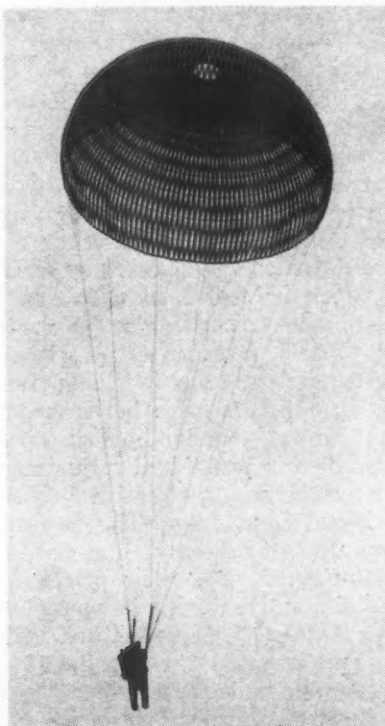
Building Items: Thousands of mechanical building items are suspended from price controls under Amendment 37 to Supplementary Order 129, including specified hardware items such as miscellaneous cast and sheet metal, screening, valves and pipe fittings, mechanically operated commercial refrigeration, etc. Few of the items will be used in the veterans' housing program and include items which either are not expected to rise in price above mandatory OPA allowance or are not significant in business-living costs.

Other Actions

Slide Fasteners: Manufacturers of slide fasteners have been granted a reconversion pricing formula because of the necessity of replacing special machinery suited only to military production. This action, effective July 26, permits use of either of two profit factors in applying for price adjustments: (1)—A profit percentage of 3.6 which OPA has determined for miscellaneous consumer durable products, or, (2)—A profit percentage figured upon the basis of the manufacturers own operating experience during the years 1936-39.

Steel Shipping Containers: Manufacturers of 12 1/2 and 25-lb capacity steel shipping containers, used by producers of white and red lead, have been given the same 10-pct increase in ceilings that was announced on Mar. 26 for steel shipping containers. The earlier action inadvertently omitted this type of shipping container.

CANOPY OF RIBBONS: A new ribbon parachute designed by AAF Air Material Command alleviates initial shock. Side-sway which is the cause of major injuries in jumping is considerably reduced.



CPA to Revive CC and MM Ratings

Washington

• • • Ignoring industry protests, CPA has announced that it will soon re-establish priorities on steel under Priorities Regulation No. 28. CPA says it will take this action to provide a means of breaking bottlenecks where steel supplies are a contributing factor. The decision was made known at a meeting of the General Steel Products Industry Advisory Committee on July 24.

This move is considered significant in view of the pressure exerted by the House and Senate Small Business committees to have CPA grant priorities for steel to small manufacturers. The Dept. of Commerce also hails the move as a great victory for "little business."

Although steel production is about normal, assistance is needed because of the impact of the housing program and other urgent programs, and many steel products will be in short supply for a considerable period, the agency said.

CPA officials told steel committee members that the rebound in the steel operating rate to around 90 pct from below 50 pct during the coal strike and the outlook for continuing high rate of operation warranted the re-establishment of special assistance under Priority Regulation 28, in the distribution of steel products.

Operation of this priority regulation on steel was suspended on Jan. 21, 1946, at the inception of the steel strike and since that day all CC and MM ratings on steel orders have been suspended.

"The main purpose of this regulation is to provide priority assistance for the attainment of a satisfactory production rate," CPA said. "It is of the greatest benefit where a large amount of material already has been obtained without priority assistance and where only a small amount of help is required for special items. The regulation also provides assistance in getting materials to operate at a minimum economic rate."

The proposed action by CPA calls for the revocation of the former ban on CC and MM ratings on steel. It is also proposed to request applications in advance of

the fourth quarter for critically needed products in the housing program.

It is proposed to limit fourth quarter priorities for housing and farm machinery to the minimum. Housing needs will not require more than 200,000 tons of steel in the fourth quarter, CPA said. Of this total approximately 150,000 tons will be steel sheets of various specifications.

Cox Succeeds Perry as Head of Carnegie

Pittsburgh

• • • The appointment of Charles R. Cox as president of Carnegie-Illinois Steel Corp., to succeed J. Lester Perry who retired from that position effective Aug. 1, was announced by Benjamin F. Fairless, president of the U. S. Steel Corp.

Mr. Perry, upon his retirement as president of the U. S. Steel Corp.'s largest steel producing subsidiary, has been appointed assistant to the president of U. S. Steel Corp. of Delaware.

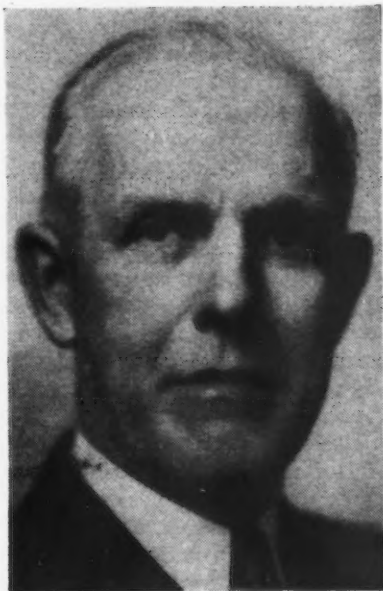
Mr. Cox has been president of National Tube Co., another U. S. Steel subsidiary, since March 1943. Having joined National Tube as general superintendent of the Ellwood works, Ellwood City, Pa., in 1934, he was made vice-president of operations in 1936,

One large item not included in the 200,000 ton housing estimate is the steel requirement for prefabricated housing. These needs are still under discussion between CPA and NHA.

Industry members said that current requirements could be handled without formalized priorities action. CPA officials stated, however, that if it is found that materials are not forthcoming on schedule some priorities aid must be rendered.

executive vice-president in 1941, and president in 1943. Prior to joining National Tube Co., he was affiliated with Babcock & Wilcox Tube Co. from 1930 to 1934, and Crucible Steel Co. of America, from 1920 to 1930.

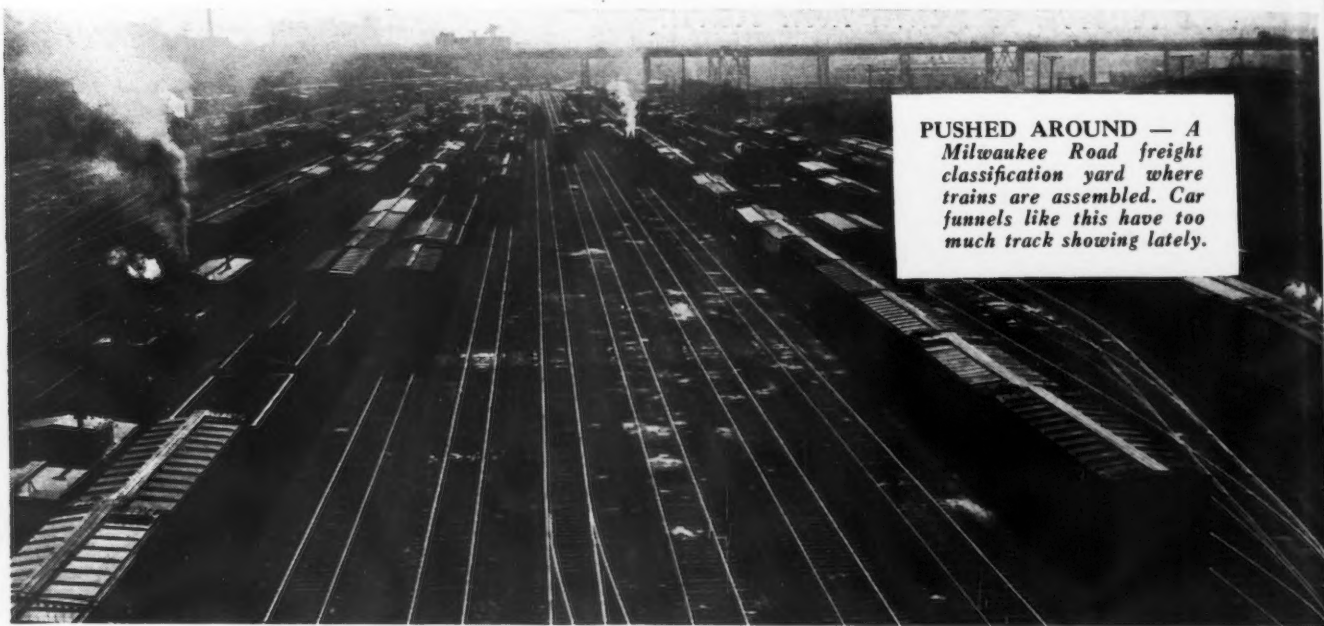
Mr. Perry's career, reading like a Horatio Alger story, runs from cost clerk at the Worcester, Mass., plant of American Steel & Wire Co. to president of Carnegie-Illinois Steel Corp. In 1899, 2 yr before the formation of U. S. Steel Corp., he joined American Steel & Wire as a cost clerk. In 1933 he was appointed vice-president in charge of operation of the wire company in Cleveland. In 1935 he became president of Tennessee Coal, Iron & Railroad Co., and on Jan. 1, 1938, he became president and director of Carnegie-Illinois Steel Corp.



J. Lester Perry



Charles R. Cox



More Freight, Less Cars Alarm Top Management

Chicago

• • • Irregular car shortages, particularly in box cars, are cropping out with alarming frequency. Executives never before concerned with car loadings, which were efficiently and quietly handled by traffic managers, are becoming acutely aware of a harassing new threat to continued operations. Shippers all over the nation are fast finding themselves on a "waiting for the train to come in" basis, and future outlook is not good.

According to A. H. Schwietert, chairman of the Midwest Shippers Advisory Board, "we are faced with the most severe freight car shortage since 1921 unless every effort is made to speed up car turn-around and fully utilize all equipment."

Forecasts for third quarter show that 25,000 more box cars will be needed in district No. 1 alone than was required in 1945. Mr. Schwietert, who is also traffic director of the Chicago Assn. of Commerce, stated that in face of this demand, "The carriers of the country find themselves with 17,000 fewer box cars than during the same period last year." It is not a case of just helping the railroads but one of self-preservation. Comparing demurrage

By D. I. BROWN
Chicago Regional Editor

• • •

charges to overtime pay for labor required to speed up turn-around, is short sighted policy as industry must ship goods to exist.

Railroads have been unable to keep cars in condition because of inability to secure skilled mechanics and repair material, particularly lumber. Car replacements, which has been hindered by strikes and shortages in both basic and car building industries, has become "a sometimes thing."

Serviceable cars show an increase of 4073, as of July 1, compared with June 1, this year. During June 3491 cars were installed compared with 3130 in 1945, 3168 in 1944. On July 1, 1946, 78,239 cars, or 4.7 pct of all box cars were awaiting repairs. During the war this figure never exceeded 3 pct.

Director Johnson of the Office of Defense Transportation has estimated that more than 300,000 cars have passed the point at which they normally would have been retired from service. Serviceable cars of all types number 1,670,461 as of July 1, 1946, com-

pared to 1,704,525 last year. During June new car deliveries were divided as follows: 1242 box cars, 242 auto cars, 1857 open top cars, and 150 miscellaneous. On order as of July 1, 1946, are, 39,437 cars divided: 12,568 box cars, 6452 auto cars, and 15,424 open top and 4993 miscellaneous.

Where are the cars coming from to handle the 2.7 pct national increase in car loadings forecast for third quarter? Repairs or replacements cannot be made in time to meet the shortage. Even if RFC were to grant priorities for building the 50,000 box cars recommended by Director Johnson, they would not be available until next year.

The only relief, said J. J. Hayden, district manager, Chicago, car service division, Assn. of American Railroads, is "faster turn-around time." Turn-around time for the month of June averaged 14.69 days, May 18.30 days, April 18.43 days and March 14.86 days, based on all serviceable cars both railroad and privately owned. ODT has asked freight receivers to make immediate provision for accepting and unloading inbound shipments over the weekend to overcome thousands of car days lost by the 5-day week.

Higher demurrage charges on

box and refrigerator cars, which went into effect June 15, were originally planned to be effective until Sept. 15. The ICC order will probably be extended unless all shippers pitch in to remedy the present situation. Cars held over because of strikes averaged 5 to 6 pct in 1945 but are a little less so far this year.

Embargoes are being slapped on consignees where necessary in order to keep rolling stock on the move. From Jan. 1 to July 10, 1946, 640 such combined car service division and railroad orders were issued as against 647 in 1945, and 646 in 1944. Freight car detention in June was the highest since February 1946, and checks in the 13 districts show detention of 18.5 pct as over the free 48 hr time allowed.

The Chicago area, with 7726 miles of track, is served by 21 class 1 railroads which originate 16 pct of the total freight hauled in the country. Forecast by the Midwest Shippers Advisory Board, of which Chicago is a part, shows an estimated increase of 4.5 pct in car loadings for 1946 third quarter over 1945. Coal and coke will be up 5 pct, ore 5 pct, machinery and boilers 15 pct, brick and clay products 15 pct, agricultural implements 23 pct, auto and trucks 124.8 pct, with iron and steel showing a decrease of 1 pct.

Metropolitan Chicago loaded 1316 l.c.l. cars in June per day compared to 1010 per day in 1945. This means 7500 l.c.l. cars needed per month in this immediate area alone. Less than carload volume is up because shippers are dividing their products to different customers as sufficient goods are not yet available to ship by carload to all accounts. Another reason is that in many consumer goods lines, demonstration units are all that is available and these are going out l.c.l. The labor supply at freight houses and docks is ample and no shortage exists in train crews or locomotives.

Mines are experiencing a scarcity of hopper cars. During June 600 new covered hoppers were delivered to the carriers and car builders promise substantial improvement by fall, on the approximate 2700 such cars now on order. Approximately 200,000 more carloads of coal, coke, ore, sand, stone and gravel, are to be loaded this year than were actually

loaded during 1945. Depleted stockpiles, increases in industrial production and a heavy export demand will require all the coal that can be produced. According to W. C. Kendall, chairman of car service division, Assn. of American Railroads, "Ample cars to expedite heavy offerings of coal is of first importance, but cannot be assured unless receivers release cars with minimum delay."

Record crops are requiring and will continue to require many class A box cars. Box car loadings for June averaged 381,725 per week, which is 13,000 more than the weekly average of the first half of August 1945. With the normal fall peak loading season

just ahead and a 53,426 carloading forecast for grain alone in district No. 1, there is no relief in sight for a box car supply. During the 6 weeks June 1 to July 13, approximately 29,000 empty box cars were delivered to the western roads, but the requirements were not met even by this substantial allocation.

A large number of elevators are closed for lack of cars and considerable wheat is stored on the ground, 15 pct of which will be lost. Movements of cars west have drained eastern and southern sections causing serious shortage in those areas. Loading of many steel products such as tinplate, sheets, nails, etc., require box cars. Such

ROLLING STOCK EQUIPMENT OF ALL RAILROADS

BOX CARS

	July 1, 1946	July 1, 1945	July 1, 1944	Increase or Decrease July 1, 1946 Compared with July 1, 1944
Owned	733,213	743,144	741,809	8,596 D
Bad Order	32,036	25,515	17,136	14,900 I
Serviceable	701,177	717,629	724,673	23,496 D

OPEN TOP CARS

Owned	862,949	869,661	852,722	10,227 I
Bad Order	38,830	33,275	21,421	17,409 I
Serviceable	824,119	836,386	831,301	7,182 D

ALL CARS

Owned	1,748,700	1,769,384	1,750,279	1,579 D
Bad Order	78,239	64,859	42,425	35,814 I
Serviceable	1,670,461	1,704,525	1,707,854	37,393 D

Actual carloadings for each district in the third quarter of 1945, the estimated loadings for the third quarter of 1946, and the percentage of increase or decrease

	1945	1946	Percentage Increase or Decrease
New England	98,252	110,957	+12.9
Atlantic States	710,562	782,946	+10.3
Allegheny	1,045,227	1,096,533	+ 4.9
Ohio Valley	970,113	973,062	+ 0.3
Southeast	772,398	816,188	+ 5.7
Great Lakes	540,828	607,729	+12.4
Central Western	320,458	293,567	- 8.4
Mid-West	934,669	975,866	+ 4.4
Northwest	801,724	783,096	- 2.3
Trans-Missouri-Kansas	440,455	441,293	+ 0.2
Southwest	549,804	469,745	-14.6
Pacific Coast	346,401	379,429	+ 9.5
Pacific Northwest	242,417	256,081	+ 5.6
Total	7,773,308	7,986,492	+ 2.7

cars are not going to be available in the quantities needed if the present trend continues.

The Carnegie-Illinois Gary plant has been periodically in trouble on box cars but has found sufficient storage facilities and has been able to continue operations. American Steel & Wire, Joliet, Ill., was in and out of trouble when at one time 45,000 kegs of nails awaited box cars.

The Carnegie-Illinois Steel Co. South Works plant was forced to temporarily suspend operations during July as the delivery of the mills was jammed with bar and structural products which could not be moved because the plant was short about 300 cars of all types.

Machinery Price Changes Must Be Reported to OPA

Washington

••• Manufacturers of certain machinery items which have been suspended from price control must continue to notify OPA whenever a price is changed, the agency has announced.

Reports of all price changes are required of manufacturers of the following items if they changed published list prices after July 26: Machine tools; instruments (electrical, electrically or magnetically actuated for indicating, measuring, recording or testing electrical quantities but not including automotive or electronic testing, etc.); automotive testing and maintenance equipment, electrical and mechanical, subject to RMPR 136; buffing and polishing wheels; compressors, air and gas, and dry vacuum pumps normally driven by prime movers of more than 10 hp, and assemblies of such equipment sold with or without prime movers, tanks, controls, etc.

Internal combustion engines, power transmission equipment, and pumps; textile machinery, except accessories and parts; floor surfacing and maintenance machinery and equipment; petroleum drilling and producing machinery and equipment; printing trades machinery and equipment as defined in Order 568, MPR, 136; and bookkeeping machinery, supplies and equipment; poultry farm equipment.

Percentage Limitation May Ruin CPA's New Export Priorities Program

Washington

••• Just 48 hr after CPA had announced a limited priorities assistance program for general steel products to meet export requirements, the proverbial "monkey wrench" had slipped into the works.

Under an amendment to Direction 10 to Order M-21, priorities assistance will be limited to a monthly total of 70,000 tons of general steel products for export. Priorities aid has also been granted for an export quota of 112,000 tons of tinplate for the third quarter.

The new amendment specifies that unless otherwise directed by CPA, no steel producer is required to accept certified export orders for any product (other than tinplate) for shipment in any one month in excess of 2 pct of his expected shipments of that product.

This limitation created the difficulty. CPA quickly found that some products—certain structural shapes, for example—are rolled by only one or two mills, and therefore it would be necessary for these mills to allocate more than 2 pct of their shipments of these products for export purposes. Consequently, the quotas for other products would be reduced for these mills and would be increased in mills having the rolling capacity for the more common products. CPA hopes that this can be worked out within the industry without the necessity of issuing an additional directive.

The priorities assistance for general steel products becomes effective with September deliveries.

In setting up the export quotas CPA placed the following monthly tonnage limits on specified products:

Nails	500 tons
Nail wire	1,000 "
Galvanized sheet	2,000 "
Buttweld and lapweld pipe 3 in. and under	500 "
Electrical sheet	250 "
Hot rolled and cold rolled sheet	3,000 "
Bars and bar size angles 1 in. and under	5,000 "
Light structurals	8,000 "
	20,250 tons

These tonnages are the maximum amounts that can be certified for export in any one month. There is no limitation on other products which will go to make up the re-

maining 49,750 tons in the monthly quotas.

Exporters who want priorities assistance on steel products must obtain the authorization, in writing, of the Office of International Trade, Dept. of Commerce, to use the symbol "CXS" on purchase orders for limited quantities of general steel products. In addition to marking their purchase orders with this symbol these exporters must specify the period in which shipment has been designated, and furnish the steel producer with a certificate, signed manually or as described in PR 7 in substantially the following form:

"I certify, subject to the penalties of section 35A of the United States Criminal Code, that the steel products covered by this purchase order are within the quantity which I have been authorized by the Office of International Trade, Dept. of Commerce, to purchase the orders identified with the symbol CXS."

CXS orders must be scheduled for production along with orders certified under Direction 9 or 12 to Order M-21 and in preference to all uncertified orders for the same product classification, except orders covered by specific written directives issued by CPA.

Mills are required to accept these orders as rated orders, and they must be accepted, scheduled and delivered accordingly. Where a conflict exists between certifications, preference must be given to the certification first received.

CPA may also establish space reservations on steel producers' schedules for the benefit of export orders where the product is in extremely short supply and export requirements require a considerable portion of the total production.

CXS orders may only be placed with steel producers for mill shipments. Mills need not accept a CXS certification on a previously accepted purchase order, which was received after the first day of the month preceding the month in which delivery is requested.

None of the provisions of the amendment restrict acceptance, scheduling or shipment of noncertified orders for export, if it does not interfere with shipments of certified orders.

Weekly Gallup Polls . . .

World Opinion of United Nations Reaches New Low

Princeton, N. J.

• • • The United Nations is getting a good deal of criticism around the world for the way it has handled its job in recent months, according to George Gallup, director, American Institute of Public Opinion.

An international poll conducted by the Gallup Poll in five nations—the United States, Britain, France, Canada and Australia—finds that in four of the countries a majority of voters who have an opinion on the subject are dissatisfied with the progress made by the UN.

The American people are especially critical in their attitude. For every person satisfied with the progress of the UN, two are dissatisfied. Britain and Canada likewise show substantial dissatisfaction, while in Australia opinion in the last test was evenly divided.

With affiliated Gallup Polls now operating in nine countries, it is possible to measure the opinions and attitudes of the common people simultaneously throughout a major section of the democratic world. In planning this poll report the directors of the American, British, Canadian and French polling organizations agreed by cable on the wording of the question, and the polling of scientifically selected cross-sections was done almost simultaneously in each country during late June and early July. In Australia, opinion was measured a little earlier—in May.

The results follow:

"Are you satisfied or dissatisfied with the progress that the United Nations has made to date?"

	Satis- fied Pct	Dissat- isfied Pct	No opinion Pct
U.S.A.	26	49	25
Britain	27	39	34
Canada	31	44	25
Australia	34	34	32

In France the vote was 8 pct satisfied, and 38 pct dissatisfied with 54 pct expressing no direct opinion on the issue itself. The latter group includes 23 pct described as indifferent—people who say they do not care what the UN

does or what happens to it. This vote may well be a reflection of the extent to which the French people are preoccupied with their own pressing internal problems rather than world affairs in general.

The poll in Australia, if repeated today, would probably find an increased dissatisfied vote, in view of the changed attitude found in other countries.

In both the United States and Britain the polls found a sharp trend of sentiment as compared to earlier surveys on the same issue. As recently as February the weight of opinion in Britain was one of satisfaction with the UN; today it is just the reverse.

The trend in the two countries follows:

	BRITAIN Satis- fied Pct	Dissat- isfied Pct	No opinion Pct
Feb.	49	20	31
Today	27	39	34
	U.S.A. Satis- fied Pct	Dissat- isfied Pct	No opinion Pct
May	37	37	26
Today	26	49	25

American veterans of World War II, who fought for the peace that the UN is supposed to help keep, are especially critical in their attitude toward the work of the UN so far. There is also more dissatisfaction among the better educated elements of the population than among those with a lesser degree of formal schooling. The vote among various groups in the United States follows:

	Satis- fied Pct	Dissat- isfied Pct	No opinion Pct
College	23	69	8
High school	26	53	21
Grade or no school	26	42	32
Veterans	27	60	13

The chief reasons for dissatisfaction in this country seems to be a feeling that the UN does too much talking without getting conclusive results.

The second main objection raised is that the UN is "letting Russia get away with too much."

• • • A slight majority of voters polled from coast to coast say that if a presidential election were be-

International Poll in Five Nations Uncovers Increased Criticism of Progress of UN

ing held today they would vote for the Republican Party.

Specially, 51 pct say they would prefer to vote for the GOP, while 49 pct say they would want to cast their ballots for the Democratic Party.

The 49 pct Democratic figure represents a sizable drop from the percentage of popular votes polled by the party in the last presidential election—54 pct.

A comparable survey on party strength conducted by the institute in early August 1945, found the Democratic Party riding high in popularity in all sections, as people celebrated the mounting victories against Japan and looked forward to a period of peace and prosperity. When asked at that time how they might vote if a presidential election were being held, 58 pct said they preferred the Democratic Party, and large majorities said they thought the Democratic Party would do a better job than the Republicans at handling a long list of pressing public problems.

The party maintained this popularity for a considerable period, but starting early this spring with the strike situation growing to a crisis, and many other problems cropping up as a result of the war, a gradual falling off of public support was noticeable in the polls.

In order to set the present situation in full perspective, the following table shows the vote in the last four presidential elections, followed by the trend of sentiment since 1944 in institute polls.

	Dem. Pct	Rep. Pct
1932 Election	59	41
1936 Election	62½	37½
1940 Election	55	45
1944 Election	54	46
Aug. 1945	58	42
Feb. 1946	55	45
May, 1946	52½	47½
TODAY	49	51



• • •
ROLLING AGAIN: Despite limited auto production, giant trailers are again beginning to dot the country's highways, to the considerable annoyance of those Americans who don't need new cars.
 • • •

Forecasters Wait in Limbo for Auto Buying Pattern to Jell

Detroit

• • • The forgotten man in Detroit today is the fellow who predicted only six short months ago that the potential demand for passenger cars and trucks amounted to 15 million units. Recently it has become fashionable for the optimists to admit under protests that it is possible to produce 5 million cars during a 12-month period and for the pessimists to ask how or where in the whole wide world could anyone make or sell that many cars at present prices.

It is difficult to underestimate the hurt being nursed at the moment by forecasters who saw automobile production during the first 6 months of this year reach only 27 pct of the output they projected for their bosses. In fact, one of the large automobile producers is so skeptical of the whole forecasting business at the moment that an order has gone down the line that no forecasts whatever are to be made for publication. (Dealers and customers have asked too many embarrassing questions). Of course, private forecasts are still being made but the results are released only after profuse apologies and an explanation that the figure is a "guesstimate" rather than a prediction.

The hasty retreat being beaten from earlier estimates of the size

By WALTER G. PATTON
 Detroit Regional Editor

• • •

of the automobile market is not hard to explain. No forecaster is ever able to object that a major strike or series of strikes is likely to occur even if he can see the strikes coming. Indeed, if any one had predicted at the start of 1946 that General Motors would be hit by anywhere from 100 to 200 strikes during most of the period he would never have been permitted to offer a guess in the first place.

Other factors are equally unpredictable. For example no one can foretell with certainty about the productivity of labor, the effect of price increases on buying attitudes of customers or what is going to happen to the "real" national income in the face of an uncertain future for OPA. These are only a few of the imponderables that tend to make hideous the life of an automobile forecaster.

There can be little doubt that the present tendency is to be pessimistic about the market for automobiles. On the other hand, it seems hardly possible that fundamental conditions existing at the

beginning of this year could have changed so much during the past 6 months that the prospective buyers of new motor cars should have been reduced almost by half.

Detailed examination of some of the factors that influence the buying of automobiles indicate that a reasonable evaluation of the potential market for automobiles may be closer to 12 million than 8 or 10 million which seem to be popular estimates at the moment. Justification for the 12 million estimate will be found in the following statistics:

According to the U. S. Bureau of Roads, there were 31,035,420 cars and trucks (including tax exempt vehicles) in operation as of December 1945. A simple calculation indicates that 12 million cars represents 38 pct of the total—i. e., this estimate assumes that a little more than a third of the cars on the road today are ready for the junk heap.

Police authorities and auto service men who have to check the condition of cars in some states would call this a highly optimistic statement of the case. It is also recognized that the service life of cars has been stretched miraculously, particularly during the war, so that many observers are inclined to wonder whether there is really a practical limit to the time a car

buyer can stay out of the market if he really makes up his mind that neither his earnings or the price of cars is to his liking.

Another way to look at the 12 million estimate is to assume that all cars produced since 1938 and including 1 million produced during the first 6 months of this year are still on the road and capable of giving satisfactory service. This would indicate that there are right now more than 14,600,000 cars and trucks on the highways which are more than 8 yr old. The question is then: What are the conditions which must exist before the bulk of these buyers can be lured into the market?

First of all there is the problem of income of the prospective buyer. D. U. Bathrick, sales manager of Pontiac Motor Car Co., has recently pointed out that estimated national income for 1946 is \$160 billion compared with \$70 billion in 1941 and \$83 billion in 1929 (when more than five million cars were sold). Meanwhile, both purchasing power and bank balances of prospective customers, while not increasing, are holding their own. There are also reports that the number of cars being sold on time payments is increasing. Whatever may be the economic soundness of installment buying, the use of installment payments has never been known to keep buyers out of the market.

It must of course be remembered that the automobile has only a fourth claim on the consumer's dollar—food comes first, clothing is next and then shelter. If the present upward price spiral gets out of hand, it is possible for the automobile to finish a poor fourth in the race for the consumer's dollar. On the other hand, there are many cases where the purchase of an automobile may be just as much a necessity as food and shelter since the automobile is actually required by the owner to make a living.

Another objection to a potential 12 million car market is the fact that competition for the consumer's dollar is probably keener today than at any time in automotive history. Manufacturers of refrigerators have set their annual goal at 5,900,000 refrigerators; the radio people estimate they will sell 5,100,000 sets and the producers of washing machines expect they will turn out 5,800,000 units when materials supply permits. Each of

these producers is aware that there are many duplicate orders on their books and some have estimated that any store which sells 50 pct of the customers who have placed orders will be fortunate indeed. This applies even though substantial deposits have been made on the order.

It is evident too that the railroads will step up their appeal to the public to utilize their services; the airlines have already established themselves as successful merchandizers of air travel and there are a great many new things

buying of course is price. It is true that the average delivered price of a passenger car has increased substantially since 1942 and in Detroit today, the lowest priced car delivers for about \$1300. However, it should be emphasized that the present price level is based on limited output and high labor costs; when output is increased production costs will be reduced and lower prices will follow. One prominent producer has already indicated that this course will be followed.

There are other factors operating in the direction of maintaining a good market for automobiles and these should not be ignored. There is for instance the fact that price increases are not such a great barrier to a buyer who has to have a new automobile. (Look at the black market during the war). There is again the factor that we now have nearly 40 million families in this country compared with only 34,800,000 families in 1940 and that many of these families have convinced themselves that two cars instead of one in the family may really be an excellent thing if not a necessity.

After examining the available evidence, it seems reasonable to suppose that the automobile industry has not yet lost half the market it thought it had at the start of this year. Perhaps 50 pct of this market has vanished under the cruel bite of strikes, increased prices and general uncertainty about the future.

However, if even a 12 million car potential really exists today and the number of new customers who will normally come into the market during the rest of this year is added to the total, it does seem possible that the automobile industry could have two or even three consecutive 5 million-car years. Whether this goal will actually be attained will depend, of course, on the amount and distribution of the national income, the number of strikes, price levels, availability of raw and finished materials, and a great many other factors both economical and political.

With no stock market tailspin yet in evidence, with buyers hungry for cars as never before in the history of the industry it does seem ultraconservative to sell the automobile industry short when it has only begun to satisfy the most tempting market it has ever had.

MOTOR CAR & TRUCK PRODUCTION UNITED STATES & CANADA

	1941	1946
January.....	524,073	119,500
February.....	509,332	83,841
March.....	533,878	140,777
April.....	489,856	248,318
May.....	545,355	247,620
June.....	546,278	214,511*
July.....	468,897	300,000*
August.....	164,793	.....
September....	248,751	.....
October.....	401,369	.....
November....	373,892	.....
December....	302,518	.....
	5,108,992	2,500,000*

* Estimated.
Peak year 1929—5,621,045.
Source: Ward's Reports & U. S.
Dept. of Commerce.

on the market today or about to enter the market—new furniture, toys, new homes, labor-saving devices and other equipment for the home or summer cottage.

In the months ahead the automobile dealer will undoubtedly have the fiercest competition he has ever encountered. At the same time, the automobile companies are at the present time making the most strenuous effort in history to build up a sales organization. Everywhere the emphasis is being placed on salesmanship. It is unlikely that many industries will be better prepared to meet the new sales competition than the automobile companies.

Another deterrent on automobile

The fact that duplicate orders are on dealer's books and frequent cancellations are expected as new cars are purchased does not necessarily mean that the potential market for automobiles has been reduced. To argue this way overlooks completely the fact that a number of prospective buyers who

would like to purchase motor cars have refrained from giving an order because their chances of obtaining delivery at the present time are not good. As soon as automobile deliveries are speeded up many of these buyers will come into the market replacing those who are today cancelling orders.

\$8,041,682, or \$2.15 a share, in the second quarter of 1945. Provision for taxes based on income was \$3,550,000, against \$21,670,000 in the 1945 quarter.

Had it not been for certain adjustments made in the first quarter, normal income taxes for the second quarter would have been around \$7,000,000, Mr. Grace explained, attributing the higher results also to the completion of some shipbuilding contracts. Net billings for the quarter were \$196,266,411, against \$142,119,602 in the first quarter and \$398,603,390 in the second quarter of 1945.

"As was stated in the report for the first quarter of 1946, extraordinary costs were incurred as the results of strikes, which were charged to income for that quarter," Mr. Grace said, "On account of such costs, \$11,000,000 was transferred to income for such quarter from the contingent reserve, which had been set up out of income in prior years.

"If that transfer had not been made, the income account for the first quarter would have shown a loss," Mr. Grace declared.

Orders on hand on June 30 totaled \$469,000,000, against \$512,000,000 on March 31 and \$468,000,000 on Dec. 31, 1945.

Tonnage scheduled for production totaled 4,966,000 net tons at mid-year, against 4,910,000 on March 31, but books on 1947 output have not been opened and the company has contracts on hand for substantially larger tonnages than the amounts scheduled, indicating a capacity demand for steel for many months to come.

Grace Says Industry Will Seek No General Price Rise at Present

New York

• • • While the steel industry will take no immediate action on general price increases, price relief will be sought soon in certain "depressed" items, Eugene G. Grace, chairman, Bethlehem Steel Corp., indicated here on July 25. Certain items such as galvanized sheets, nails and baling ties may have to be increased soon because producers are losing money on them at current prices.

Aside from these "depressed items" Mr. Grace stated that the industry was barely emerging from the strike period and had not "got its bearings" as to the true relationship between current prices and costs over an extended period.

Bethlehem, it was said, has lifted its new construction budget from \$135,000,000 to \$190,000,000 between March 31 and June 30, with one-half due to a re-estimation of construction costs in the light of mid-1946 conditions, and one-half to substantial additions proposed at the Sparrows Point,

Md., plant, to provide steel for expanded flat rolled products demand.

Additions at Sparrows Point will include a new blast furnace, a new battery of coke ovens, two new open hearths, and other additions and improvements costing \$25,000,000 to \$30,000,000 which will add 45,000 to 50,000 tons monthly to steel output of the plant. It will take two to three years to complete the new facilities. Current steel production by the corporation is at 99 pct of capacity, comparing with an average of about 77.5 pct for the second quarter and 49.7 pct for the first quarter of 1946.

The board of directors voted the usual common quarterly dividend of \$1.50 a share and the regular preferred dividend of \$1.75 a share, with net profit for the first half of 1946 reported at \$19,251,645, or \$5.35 per common share, against \$15,737,591, or \$4.18 a share, in the first half of 1945. Net billings for the six months were \$338,386,013, against \$780,865,054 in the 1945 period.

Net profit for the second quarter was \$14,447,207, equal after preferred dividends to \$4.29 a common share, comparing with

PIG IRON RECOVERY: Pig iron output in June moved up to 66.5 pct of capacity compared with 39.8 pct in May. The July figures should be somewhat higher in reflecting additional furnaces which have been returned to operations after repairs were made.

Blast Furnace Capacity and Production—Net Tons										
	Number of Companies	Annual Blast Furnace Capacity	PRODUCTION							
			PIG IRON		FERRO-MANGANESE AND SPIEGEL		TOTAL			
			June	Year to Date	June	Year to Date	June	Year to Date	Pct of Capacity	
									June	Year to Date
DISTRIBUTION BY DISTRICTS:										
Eastern.....	12	12,988,970	700,228	3,258,693	24,004	89,446	724,232	3,348,139	67.8	52.0
Pittsburgh-Youngstown.....	15	25,939,940	1,352,996	6,681,005	12,231	49,708	1,365,227	6,730,713	64.0	52.3
Cleveland-Detroit.....	7	6,557,500	414,888	2,044,268			414,886	2,044,268	78.9	62.8
Chicago.....	7	14,093,510	795,022	3,809,111			795,022	3,809,111	68.8	51.5
Southern.....	9	4,924,670	269,094	1,318,324	9,034	47,087	287,098	1,365,411	68.8	55.9
Western.....	5	2,836,000	104,808	*509,179			104,808	*509,179	44.9	38.2
TOTAL.....	36	67,340,590	3,637,034	17,620,580	45,239	186,241	3,682,273	17,806,821	68.5	53.3

* Adjusted.

Canadian House Committee Hears Wage Demand Called Spur to Inflation

Ottawa

• • • Donald Gordon, chairman of the Wartime Prices and Trade Board appearing before the Canadian House of Commons Industrial Relations Committee, in explanation of the board's position regarding the inflationary aspects of wage increases stated:

"I do say to the committee most emphatically that a wage increase as suggested by the United Steel Workers' union is going to have such an effect throughout the whole price structure that I seriously doubt if we should attempt any longer to hold the price structure we've achieved. Any wage increase is inflationary.

"We have had strikes in our field of endeavor. We have forced management in the interests of the public in regard to many lines of goods to produce goods which we thought must be produced to meet the minimum requirements of the people. We have had manufacturers tell us that they will not produce thus and so because they would prefer to produce other lines at a higher profit margin and we have prevented them from doing so."

The union seeks a 19½¢ per hr increase in Ontario plants operated by the Steel Co. of Canada and the Algoma Steel Corp. and a 24½¢ increase in the Nova Scotia plant of Dominion Steel and Coal Corp.

Mr. Gordon stated that a 10¢ increase, while it might not be the "breaking point" in the price line, would be the beginning of the end."

Ottawa

• • • Justice W. E. Roach, appearing before the Parliamentary Labor Relations Committee, in connection with the strike at plants of the "Big Three" of the Canadian steel industry, stated that his preliminary hearings led to his learning from the union with "a preciseness that would permit of no misunderstanding," of a condition which he described as the very "antithesis of democracy."

The union has informed him that locals had delegated bargaining powers to the National Advisory Committee, and that any proposals would first be submitted to this

committee, which could or could not as it saw fit submit the proposals to the locals. In fact, the negotiating committee itself could spurn any proposals or could submit to the National Advisory Committee if it considered it reasonable.

When he told the union he considered this to be undemocratic, he had been told that under the constitution any 10 members of a local could demand that a local meeting be held for consideration of any proposal the 10 felt to be reason-

able, even though it had been spurned by the negotiating or advisory committee.

Justice Roach then read his conclusions and summary, saying, in part:

"That is not collective bargaining as I understand it. By the expediency of this ballot a ring has been woven around all those employees and no matter what proposition may be submitted to any of these companies it must first of all be submitted to the scrutiny of that group of men who will decide whether it is reasonable or not reasonable, notwithstanding what may be the wishes of the men in this industry."

Canadian Steel Output Cut Further by Strike At Tube Making Plant

Montreal

• • • As a further setback to Canadian steel production some 800 workers at the plant of Canadian Tube & Steel Products, Ltd., here, subsidiary of Dominion Steel & Coal Co., walked out on July 25, forcing total suspension of operations at the Montreal works.

It is also reported that the fabri-

cating plants of the Steel Co. of Canada, Ltd., in this area soon will cease operations due to shortage of raw materials, and similar shutdowns will be necessary at other subsidiary plants of the Steel Company, at Swansea, Toronto, and Hamilton. However, operations continue at the main works in Hamilton.

Suspension of all deliveries of steel by the Steel Co. of Canada, Algoma Steel Corp., and Dominion Steel & Coal Co., already are having serious effect on operations of the various companies that are big consumers of iron and steel in their manufacturing activities.

Officials of National Steel Car Corp., Hamilton, announced that 300 men were idle at the middle of the week and 500 are due to be laid off if there is no immediate improvement in steel supply. At Fort Williams, Ont., Canadian Car & Foundry Co. has started laying off 300 workers.

It is questionable as to how long railroad rolling stock builders in Canada will be able to maintain production under existing steel conditions.

Canada Freezes Nails For Low Cost Housing

Ottawa

• • • All stocks of nails in Canada have been frozen and diverted into low cost priority housing, C. D. Howe, Minister of Reconstruction stated in the House of Commons. "It is only a matter of time," he added, "when shortage of nails will practically close down building construction in this country."

FAWNCY! WHAT?: *If this new gadget has large sales in England where it was conceived, early morning tea will be no trouble at all. Maybe some American firm will take notice and do something about early morning coffee.*



Stockpiling Bill Signed; Joker Clause Defeats Its Major Objectives

Washington

• • • President Truman has "reluctantly" signed the Thomas-May Stockpiling Bill (THE IRON AGE, May 30, p. 90), it has been announced from the White House. The chief executive explained that he was forced to sign because of the importance of the government having stockpiling power.

Administration objections were largely confined to the "Buy American" clause which makes it mandatory to purchase stockpile materials from domestic sources if available.

"These provisions," Mr. Truman said, "will not only materially increase the cost of the proposed stockpiles but will tend to defeat the conservation and strategic objectives of the bill by further depleting our already inadequate underground reserves."

Also, he said, the clause could conceivably conflict with our foreign economic policy as well as tend to delay enlargement of the raw materials stockpile.

It is generally believed, however, that administration objections to the buying provisions are somewhat offset by another which permits exceptions in the event that domestic procurements are found to be "inconsistent with public interest or the cost to be unreasonable."

New York

• • • Had the government been forced to follow an inflexible "Buy American" policy in World War II

this country would have lost the war. Unless one provision of the stockpiling bill signed last week is liberally interpreted by this and future administrations in Washington stockpiling for steelmaking will suffer seriously.

The President's criticism of the bill indicates that the policy of his administration will tend toward a reasonable interpretation of the clause permitting foreign purchases provided they are not "inconsistent with public interest or unreasonable in cost."

Nevertheless the requirement that strategic and critical materi-

als be purchased domestically if possible is seen as a dislocation of normal production and marketing sources. It may well lead to a concentration of purchases in the domestic market with a consequent abnormal loss of vital underground resources. Then, in time of war, there would be very little reserve to fall back upon.

At the start of the war the Metals Reserve Co., a subsidiary of the Reconstruction Finance Corp., was stockpiling the following materials vital to steelmaking and allied activities: Manganese ore (ferro-grade), chromite, tungsten ore (60 pct WO₃), tin and vanadium. All of these materials were imported and in some cases, as may be seen from the tables below, imports made up the bulk of the supply.

Ex-River Coal Rate Cut Lost to Users Because of New Hike

Pittsburgh

• • • "Now you see it—now you don't" is an accurate description of the reduction of ex-river rail rates for coal shipments from Colona and Conway, Pa., to the Youngstown district. Last October, the Interstate Commerce Commission reduced these rates from 90¢ a ton to 80¢ a ton, effective Feb. 1, 1946. The recent rate increase for rail shipments increased those same rates a total of 6¢ a ton, bringing them back to 86¢ a ton. This rate will go into effect at the same time the general rail rate increase becomes effective. Thus, a total of several years of legal work by the coal consumers of the Youngstown-War-

ren area have resulted in a net rate reduction of 4¢ a ton.

The original case on the 10¢ a ton reduction is ended unless the railroads appeal the decision of the District Court, but it is believed by some observers that the railroads will permit the decision to stand without an appeal. However, consumers are still unsatisfied with the decision, pointing out that even the 80¢ rates are unfair and inequitable. They point out that the rate per ton of coal shipped from Conway-Colona to Youngstown is anywhere from 16 to 65 pct higher than the rates for similar rail hauls in other parts of the country.

However, it is felt that an appeal of this rate would not be timed very well if made now, since the trend on rail rates and all other prices is upwards. For the long range picture, it is fairly certain that commercial coal consumers will seek further to reduce the ex-river coal rate so as to better equalize the rates into this area.

What will be done concerning the latest increase of 6¢ a ton is not yet known. The possibilities are several. The state could disallow any freight rate increases on intra-state shipments, but that would not affect these rates because the shipment moves from Pennsylvania into Ohio.

On the other hand, an appeal could be made to the ICC to make the ex-river rate an exception to the general rate increases or the matter can be taken to the courts to disallow the increase.

MANGANESE ORE (Ferro Grade) (Long tons)

	U. S. Production	Imports
1941	87,794	1,714,581
1942	190,748	1,583,024
1943	195,096	1,511,630
1944	241,170	1,815,508

CHROMITE (Short tons)

	U. S. Production (Shipments)	Imports
1942	112,876	981,607
1943	160,120	928,576
1944	45,629	848,390

TUNGSTEN (Pounds)

	U. S. Production	Imports
1941	6,420,303	13,152,716
1942	8,977,575	15,409,814
1943	11,472,985	18,678,426
1944	9,763,695	18,238,897

VANADIUM (Pounds)

	U. S. Production	Imports
1941	2,513,051	2,138,608
1942	4,439,130	2,422,376
1943	5,586,492	2,052,620
1944	3,527,054	1,284,603

Source: U. S. Bureau of Mines, Minerals Yearbook.

Geneva Steel Making Rapid Gains in Resuming Production

By TOM CAMPBELL
News-Markets Editor

New York

• • • Geneva Steel Co., subsidiary of U. S. Steel Corp. near Salt Lake City, is rapidly regaining former key workmen as the management rushes plans to substantially enlarge the force and get steel production going on a much larger scale. Currently the number of employees on Geneva's payroll approximates 2000, a gain of 500 within the past several weeks. During the war peak employment approximated 5000, and at the low point when the plant was practically shut down total workers numbered about 500.

Heartening to Geneva management is the apparent fact that the majority of the former key workers, including rollers, openhearth foremen, first helpers, and other craftsmen urgently needed to form a nucleus of the entire working force, are flocking back to their old jobs at the Geneva works. These men hail from all parts of the United States and from various steel companies. Some sources had expected that once having left Geneva they would not return if the plant again resumed output.

This week, only a short time after the U. S. Steel Corp. took over from the government, there was expected to be two openhearth in operation out of a total of nine with the possibility of a third next week or the week after. Two blast furnaces were in operation out of three and the third one was being repaired with the probability that it would be blown in within the next six or seven weeks.

While the overall changes and additions to be made in Geneva equipment costing more than \$18 million will probably take about 18 months to complete, production of many items will not be held up during that period. During the time the two extra stands are being installed on the plate mill and the

coilers added, plate production will continue at as great a pace as possible. No heavy gage sheets will be rolled on the mill until it has been revamped, but Geneva, it is believed, has substantial plate orders on the books, including some for export from the U. S. Steel Export Co. Additional plate orders will be received by Geneva as production is stepped up.

Considerable output is in prospect for the structural mill. While this equipment is set up to roll heavy structural shapes up to 18 in., many other products can be produced on it if the need arises. Due to experience gained during wartime days when this structural mill turned out shell steel, the man-

Fish Put Bite On Steelworkers

Salt Lake City

• • • Hundreds of former key employees are flocking back to the Geneva Steel plant as it attempts to speed output to maximum levels as rapidly as possible.

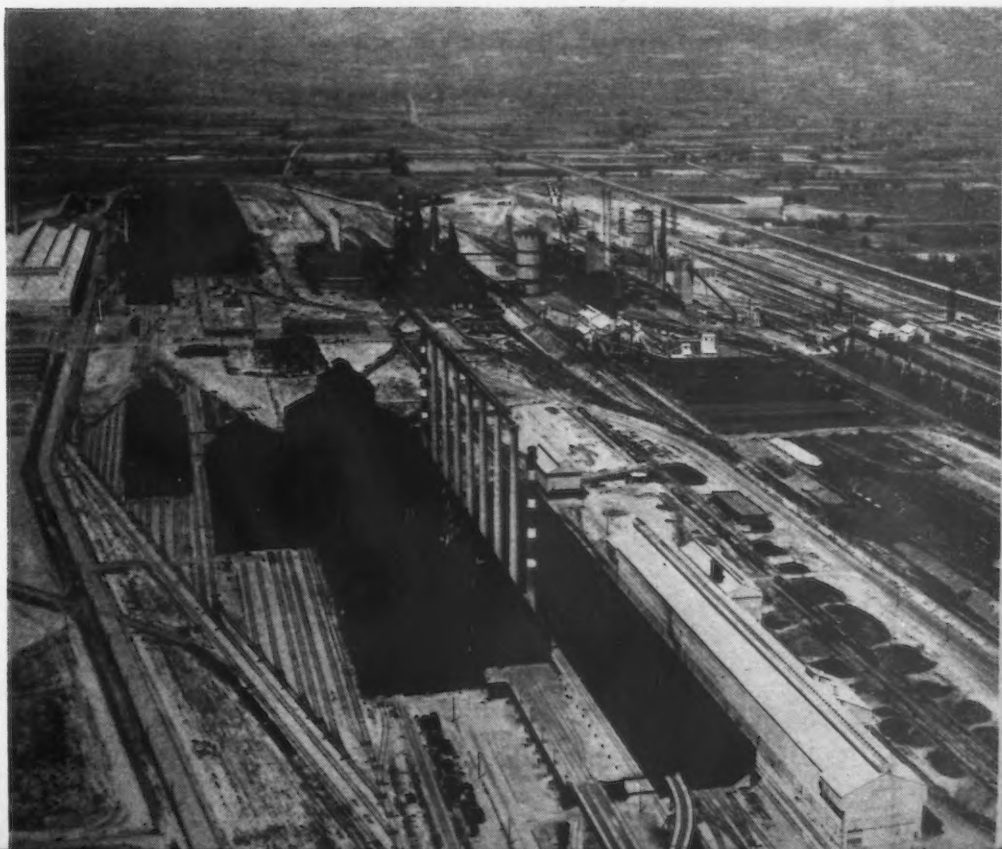
According to the wags in the steel industry, many of the men from the Allegheny and Ohio Valleys found the fishing extremely good in Utah and the hunting excellent when they last worked at Geneva.

Some sources say that the lure of the mountain streams, the snow in July, and the wide open spaces has as much to do with bringing these men back as their interest in steelmaking.

agement is now in a position to produce rounds and squares ranging from 3 in. to 6 in. as well as flats and even sheet bars if necessary.

Should future plans call for certain finishing facilities, as is likely, the structural mill will also be in a position to produce heavy rails, splice bars and tie plates. With such a tentative program, Geneva's

• • •
AT LONG LAST: No longer a government plant but a full fledged subsidiary of U. S. Steel Corp., the Geneva Steel plant under the constant prodding of Walther Mathesius, president, is on its way to a high level of steel production with "old hands" returning at a rapid rate.



structural mill will become almost "a Jack of all products."

When the plate mill has been completely revamped so that it can roll sheets, it is expected that widths up to 72 in. and gages down to 18 will be produced. As reported previously, coils of hot-rolled strip will be sent to Columbia's Pittsburgh, Calif. cold reduction plant when it is completed.

Because of its location and relationship to some other subsidiaries of the U. S. Steel Corp., it is the writer's opinion after having visited Geneva that it will constitute a separate subsidiary of U. S. Steel's long list of plants, and that the present management will be "on their own" as they bring this newest member of the U. S. Steel family up to maximum productive capacity.

While Mr. Fairless, U. S. Steel president, is on record that Geneva will be named the basing point for the products made there, what these prices will be is apparently still undetermined. A likely guess is that the Geneva basing point prices will be the West Coast price for such a product less the freight involved. The latter may change as the years go by if efforts for lower freight rates are successful—a goal much sought after by the company.

Shipments of Track Accessories Improved

Pittsburgh

• • • While manufacturers are far behind on their deliveries of railroad track accessories, such as track, frog, switch, car and gage bolts, screw spikes and boiler tubes, manufacturers indicate that the mills are likewise well behind in their deliveries of steel from which such items are made. However, both railroads and track accessory manufacturers indicate that their respective supplies of materials are coming in better every day.

There appears to be no indication that the railroads will suffer any holdup in track laying and improvements because the supply of track accessories is at least up to the supply of new rails. While track accessories are behind in deliveries, rails are likewise. While the whole program of tracklaying and rehabilitation of roads is behind schedule, they are not out of kilter from the lack of any specific commodities. Rails scheduled for delivery in the first quarter of 1945 were delivered in the second and third quarters.

Manufacturers indicate that they are not quoting a delivery on their products, because their backlogs are

now running about seven months of peak operation and up to now their production has only been running about 33 pct of capacity because of the lack of steel. As raw material deliveries increase, production schedules will be stepped up accordingly. Boiler tube delivery promises are running into the first and second quarter of 1947.

While railroads would like to see deliveries in greater quantity, they are welcoming the regularity of shipments during recent weeks. It is believed by some observers the price has a great deal to do with the volume of shipments, feeling that if the OPA question was settled once and for all, volume of shipments would increase.

Plant Closes Due To Lack of Raw Materials

East Chicago, Ind.

• • • International Smelting & Refining Co. plant at East Chicago, Ind., leading producer of white lead and zinc oxide for the Anaconda Copper Mining Co., has been closed because of a shortage of raw materials.

Employing 475 men, the recent operations of the plant have been concentrated on the production of white lead. The refined lead capacity of the plant as of 1941 was given officially as 84,000 annual net tons.

Trade authorities cite the low ceiling prices set by the OPA as the reason for the increasing shortage of lead in this country. Reopening of the plant will be based on the availability of materials which at present show no promise of early improvement. An insufficient supply of labor, it was asserted, also contributed to material shortage, although the government paid miners approximately \$17 million in wage subsidies last year to increase domestic production. Imports to this country have been discouraged by the official OPA ceiling price of 6.5¢ per lb, whereas foreign prices average considerably more.

Demand has been estimated at 1,058,000 tons of lead. With approximately 385,000 tons of domestic lead produced in 1945, the gap can only be filled by either recoveries of used lead or by imports. It is not likely that relief will be had by imports as long as the price remains as it is now.

Coming Events

- Sept. 10-14 American Chemical Society, exposition, Chicago.
- Sept. 11-12 Society of Automotive Engineers, national tractor meeting, Milwaukee.
- Sept. 16-20 Instrument Society of America, first conference and exhibit, Pittsburgh.
- Oct. 1-4 Assn. of Iron & Steel Engineers, Iron & Steel Exposition, Cleveland Public Auditorium, Cleveland.
- Oct. 3-5 National Electronic Conference, Chicago.
- Oct. 3-5 Society of Automotive Engineers, aeronautic meeting and display, Los Angeles.
- Oct. 9-11 Porcelain Enamel Institute, University of Illinois.
- Oct. 10-12 American Society of Tool Engineers, semi-annual convention, Pittsburgh.
- Oct. 28 American Institute of Steel Construction, annual convention, Coronado, Calif.
- Oct. 28-30 American Gear Manufacturers Assn., semi-annual meeting, Chicago.
- Oct. 29-Nov. 1. Refrigerator Equipment Manufacturers Assn., exposition, Cleveland.
- Nov. 7-8 National Founders Assn., New York.
- Nov. 17-22 American Welding Society, annual meeting, Atlantic City, N. J.

The London **ECONOMIST**

The Loan at Last

THE legislation authorizing the American credit to Britain was accepted by the House of Representatives in Washington Saturday afternoon, July 13, by a margin of 64 votes and was signed by the President on Monday. Among all the controversies that surround the loan, in both countries, there will be a unanimity of relief that at last the long debate is over. The 7 months that have elapsed since the agreements were signed last December have not greatly changed the position with which they were intended to deal. Such changes in circumstance as have occurred have, on the whole, told against the complex structure of international economic reconstruction, of which the loan was intended to be the keystone. The rise in the American price level, for example, has diminished the real value of the money to be borrowed, without any firm assurance that the dollars in which repayment will be made will have an equally low value.

The gratifying speed with which British exports are recovering has encouraged hopes that the gap in the British balance of payments in the period of transition will not be as large as was feared. In general, the return of some circulation to the shriveled arteries of British trade, though it is causing pins and needles, is also creating a certain resurgence of confidence in British economic strength in the world. The development of affairs in America in these 7 months, on the other hand, does not lend very much support to the assumptions of stability and responsibility on which the Bretton Woods doctrines are based. There is a touch of the old Coolidge-era bravado about the present incipient boom, and a touch also of the Coolidge-era indifference to the welfare of other nations. The arguments for the loan that seemed to have the most powerful appeal to Congressmen were not, on the whole, those that expounded the advantages of unrestricted trade among nations, but those that fitted

the loan into some highly-colored doctrine of the balance of power.

There is, thus, no call to modify in any way the opinions on the loan that have been expressed in *The Economist*. The loan itself—once granted the preliminary point that the appropriate way to handle the clearing up of the mess left by the war was by lending and borrowing—is a generous arrangement. Taken together with the settlement of outstanding lend-lease balances, it is a very generous arrangement. But the conditions attaching to it, explicitly and implicitly, turn it into a very hard bargain for the British people.

THIS is so for two sets of reasons. First, even if the permanent system planned for international commerce and finance were itself perfect, Britain is to hustle towards that permanent system with a haste that takes unfairly little account of the grievous economic wounds that this country has suffered in the common cause. The outstanding example of this type of provision is the clause by which Britain undertakes to pay for its current imports in gold or dollars, if required to do so, in 12 months' time from now. Other countries, even if they are signatories of Bretton Woods, have 5 years' grace before they can be called upon to assume a similar obligation. This might mean that, for 4 yr, Britain would have to pay for the whole of its imports in hard currency without being able to earn hard currency by its exports, except for such part of them as were sold in North America.

The second set of objections to the conditions attached to the loan is that Britain is asked, and in some respects obliged, to commit itself permanently to the obligations of a "free," multilateral, non-discriminating system of trade and exchange before it can be seen whether the assumptions on which alone such a system is workable are likely to be justified or not. The

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most important of these assumptions are two. The first is that the nations, and pre-eminently the largest among them, will, by the method of the "free" market, bring their purchases and sales sufficiently close together that the margin can be taken care of by short-term credits and normal capital movements. If not, any international monetary system will collapse as the revived gold standard did. The other assumption is that no nation will allow itself to become a center of infection for contagious deflation. If this assumption is not justified, no international commercial system will stand up.

TO underline these assumptions is not merely to indulge in pessimism. They have a strict relevance. For, if the assumptions hold good then the path that is mapped out by the loan and Bretton Woods and the proposals for an International Trade Organization is the best path to follow. But, if they do not, there could be few more disastrous. Given full employment and relative equilibrium in countries' international accounts, then a free, multilateral, non-discriminating system is the best possible. But if the future is going to bring instability of trade and exchange, then a regime of fixed exchanges and free trade ensures the quickest possible spread of the infection across the world.

These arguments are repeated here, as the Americans would say, for the record. Since last Saturday, they are of historical interest only—that is to say, they have relevance in the past and they may have rele-

(CONTINUED ON PAGE 130)

AAF's 700,000 Items Indicate Magnitude of Surplus Disposal Task

By HARRY S. ROBINSON, II

Cincinnati

• • • The surplus property situation has confounded Congress, irritated businessmen, and disappointed the public. Critics have arisen from all quarters, laws have been enacted and revised, there have been many investigations, recommendations, and plans of action. Through it all the situation re-

Ed. note: Due to the interest in disposal of surplus material this article by Mr. Robinson, formerly associated with Air Corps surplus disposal, is offered as an explanation of the gigantic job involved.

mains about the same. No one will deny that the disposal of surplus property is pretty much of a mess, but beneath the surface there are a number of facts which tell an interesting story when tied together.

Take the Army Air Forces for example. At the peak of its supply activities the AAF stocked some 700,000 different items ranging

from fish hooks to bombers and consisting not only of aircraft and engine spare parts but also including electronics and emergency rations, office supplies and bombing equipment, paint and machine tools, cameras and mobile cranes, portable hangars and textbooks. Of these 700,000 different items, surpluses developed in the case of between 450,000 and 500,000 of them. There were even surplus live monkeys from the Aero Medical Laboratory at Wright Field to be disposed of.

The AAF led all the other technical services in the variety and total dollar value of its surplus property. The original purchase price of all the AAF surplus property in this country will probably exceed \$8 billion by a wide margin when the final computations are made. This property was located in 12 large control depots, about 50 specialized depots, and in 400 odd bases and stations. Some items were surplus quite literally

in handfuls, others in carloads, and a few in trainloads.

No corporation in the world could boast of an inventory even approaching this in quantity and diversity of items; no company has ever tried to operate as many widely scattered warehouses. Even in terms of multiples of existing enterprises it is all but impossible to measure the scope of the problem, remembering, of course, that the Air Corps' situation differed from that of the other branches of the Army and Navy only in the number and type of items stocked.

It is probably well at this point to answer those who don't understand the reason for surpluses in such astronomical quantities. Bad planning, overprocurement — those are usually the first words mentioned. Actually sound planning, superlative engineering development, and victory created the surpluses. 'Remember Hong Kong, Singapore, Bataan, Dunkirk and the others where "too little and too late" were the closing words of a chapter? In the race to get ahead and stay ahead of the enemy in the quality of our weapons, equipment was made obsolete overnight; you don't win when you're second best.

As Maj. Gen. Hugh Knerr said, "To the victors belong the surplus;" when the end came we were prepared to supply our troops with more and better weapons than ever before. Unlike a production line, victory could not be scheduled as was proven by the Battle of the Bulge.

At first, little was said or done about surplus property since the main effort was to carry on the war and because it was feared that the question of surpluses would affect the morale of a nation that was daily being urged to greater productive efforts. Early in 1944 the mounting stocks of obsolete equipment so clogged the AAF supply system that it became imperative that the "dead" items be removed from "active" stock.

At the same time Congress passed the Surplus Property Act which became law with the signature of President Roosevelt. It is not often recalled that the President signed the bill with severe misgivings over its obvious inadequacies; even as he signed the President asked Congress to prepare a more

(CONTINUED ON PAGE 138)

TOO HOT TO HANDLE: GIs test for vaporized gas atop German poison gas holders in the hold of a ship where 64 workers were recently burned by mustard gas. A labor shortage resulted after the incident.



Says German Steel Mills Trail American Equipment

Cleveland

• • • German steel mills, core of enemy war production on both World Wars and egregiously propagandized as supercolossal, resemble closely the steel mills of 40 yr ago in the United States, according to James L. Hyland, manager, Cleveland district, Republic Steel Corp.



J. L. Hyland

Mr. Hyland, who recently returned to this country after serving a year as deputy chief of the Metals Section of the Economics Div. of the United States military government in Germany, revealed the German steel industry does not have the modern rolling mills which are used in this country.

"German blooming mills are about the same as ours, two-high reversing, but otherwise they employ the old-fashioned hand mills which have practically passed out of the picture in this country," he said, adding that German bar mills are hand mills, and accordingly more costly and slower.

Mr. Hyland, who had unlimited opportunity to inspect German steel making methods and working conditions, pointed out that the Germans made a greater percentage of high grade steel in electric furnaces than the U. S. steel industry does.

"They don't attempt to make high grade steel in the openhearth over there," Mr. Hyland said. "When they want a special grade, they make it in the electric furnace."

Over half the German steel production is by the Thomas process, or basic Bessemer practice, because the German steel industry doesn't get the low phos. iron ores which are available to the steel industry in this country.

In Mr. Hyland's opinion, ordinary grades of German steels are not as good as ours, primarily because they don't have the need for them. At the same time, finishes

on German steels are not as good as finishes on the U. S. product, but the interiors are about equal.

German coke-making methods come nearer to comparing with U. S. practices than anything else in the steel industry. But in Germany, he pointed out, less than 50 pct of the coke is made for the steel industry, whereas a much higher percentage goes to the steel industry in this country.

On the whole, German metallurgists know as much about alloys as the metallurgists do in the United States, Mr. Hyland feels, and their alloys are just as good—not better, he emphasized—but just as good.

Working conditions in German mills haven't much to compare with mills in the United States, Mr. Hyland said. German mills are not improved as far as comfort is concerned anywhere, and conditions approximate those in which steel labor worked in this country years ago.

"The German steel industry as such has done nothing to make working conditions desirable; they've just got mills there and nothing to improve the comfort of the workmen," he continued.

German steelworkers are not as efficient as ours, although they are just as energetic, but because they don't use the same methods, they don't get the production per man-hour that the steel industry does

in the United States. They do, however, get about 60 pct as much per man hour as our industry does for about a fifth as much money, Mr. Hyland said.

Main difference between the German mills and ours is that they are not at all careful with labor, and are without labor saving devices. Average steel labor pay is at the rate of 1 mark and 20 pf per hr, which at the current rate of exchange amounts to about 12¢ over here, and about 30¢ at the previous rate of exchange. Thus, there is no reason for labor saving machinery or methods.

Most German steelworkers walk to work, Mr. Hyland related; a few have bicycles and some of the management have automobiles. But there is no auto parking lot problem around German steel mills—a few bicycle racks take care of that.

Mr. Hyland, who helped set the 7,500,000-ingot ton limit on German steel production, said that unless some major revision is made, the steel industry the Germans have left will be kept very busy.

He said heavy tube mills, large presses and forges are being removed, and the Krupp armament works will be dismantled and partially destroyed, because of its obsolescence. The Goering works will be put up for the four powers to take what they want as reparations.

Navy Precision Gage Lab at Ohio State

Columbus, Ohio

• • • The Navy has selected Ohio State University's department of industrial engineering as a depository for a precision gage laboratory now being set up in the industrial engineering building, Dean Charles MacQuigg of the College of Engineering has announced.

The equipment, difficult to obtain on the market, is awaiting opening by Naval Ordnance inspectors and it is expected that the laboratory

will be in operation by the fall quarter.

The new gage testing center will be used to train students in precision work and gage checking and testing. It also will serve as a research center on quality control projects and will be available for testing products being made for the Navy, as well as for other Naval Ordnance uses.

The laboratory work will be directed by Professors Jay N. Edmondson and Paul N. Lehoczy and will be operated in conjunction with an expanding production engineering curriculum.

Industrial Briefs . . .

• **ERECTS FOUNDRY** — Agerstrand Corp., Muskegon, Mich., is erecting a foundry 60 ft x 180 ft for their own needs. Centrifugal Machine & Engineering Co., Kalamazoo, Mich., is furnishing the machinery and equipment. David L. Green Construction Co., Muskegon, is the contractor. Estimated cost \$50,000.

• **PURCHASES BUILDING** — Dewalt Machine & Engineering Co. has purchased the four-story building at Assonet and Gold Sts., Worcester Mass., for \$48,500 from the WAA. During the war the building was used by the Wyman-Gordon Co. as a personnel office. The Dewalt company will devote its new quarter to the manufacture of oil burners.

• **PLANT SOLD** — The Harrison Abrasive Corp., Manchester, N. H., is now a wholly owned subsidiary of Metals Disintegrating Co., Inc. of Elizabeth, N. J. Nathan C. Harrison is president, treasurer and director of Harrison Abrasive Corp. and William O. Faxon, II, is vice-president and director. Other directors are Harold E. Hall, Jean H. Hall, Dr. E. W. Wescott and J. F. Sachse.

• **PLANS NEW WAREHOUSE** — Fisher Bros. Steel Corp. of New York has purchased a plot of 77,000 sq ft with 285 ft fronting on the New York Central Railroad in the Bronx for the erection of a new steel warehouse.

• **BUYS LEMPCO PLANT** — Sale of the LempcO Products Inc. plant at Byesville, Ohio, to General Electric Co., Cleveland, for \$385,600 has been announced by War Assets Administration. General Electric will use the plant for the manufacture of incandescent lamps, according to the WAA announcement.

• **LEASES PLANT** — Cooperative Steel Treating Co. recently incorporated in Cleveland for \$25,000, has leased the powerhouse on the lakefront formerly operated by American Shipbuilding Co. and will specialize in sandblasting and heat treating. Chester M. Stoll, formerly connected with the heat treating dept, Cleveland Pneumatic Aerial Inc., is president of the company. Charles Vejvoda, also a former Aerial employee, is vice-president.

• **PURCHASES FACTORY** — The Forker Corp., Cleveland, has purchased a new factory with 2 acres at 2044 Random Road, as part of its expansion program. The new site, in addition to providing better manufacturing facilities, also has a four-car railroad siding which will enable the company to expedite customer service.

• **BUYS FOUNDRY** — The American Well Works, Aurora, Ill., has purchased the Atlas Foundry located at 2300-24 Bloomingdale Road, Chicago. The present management and organization of this foundry has been retained and will operate the plant as wholly-owned division of the American Well Works.

• **PLANS NEW WAREHOUSE** — A. M. Castle & Co. has announced the purchase of a warehouse site in Kansas City. Authority for the building has been received from CPA for immediate construction. Large and diversified stocks of steel will be carried in the Kansas City warehouse to serve the central and southwest areas.

• **NORDBERG EXPANDS** — The Nordberg Mfg. Co., Milwaukee, has acquired government facilities constructed at the plant for naval production during the war for an estimated \$355,935 to cover shop buildings and equipment.

Justice Dept. Approves WAA Plant Sale to C-I

• • • The Dept. of Justice has given its approval of the WAA sale of the scrambled facilities at the Homestead, Duquesne and Braddock, Pa. plants to the Carnegie-Illinois Steel Corp.

In a letter to WAA last week, Wendell Berge, Assistant Attorney General, said that the sale of these properties to Carnegie-Illinois "is not, in the circumstances, viewed by us as constituting a violation of the anti-trust laws."

Dept. of Justice approval had been expected, largely because there is no practical means of disposing of government-owned scrambled facilities except to companies who operated them during the war as units of their own plants.

The difficulty of separate operation of scrambled facilities was recognized by WAA in its recommendation that the sale be made to Carnegie-Illinois.

"Any attempt to make those government owned facilities capable of independent operation would involve (a) heavy expenditures to duplicate the privately owned and necessary, existing steel processing department and (b) would require additional land suitably located on which to build the duplicate facilities," it was stated.

Great Lakes Freight Decontrolled by OPA

Washington

• • • OPA has announced suspension from price control, effective July 26, of charges by water contract carriers operating on the Great Lakes. Common carriers are not affected by the action.

Suspension of price control on charges except for shipments of coal, intra-harbor operations, and water transportation on the Great Lakes had previously been placed into effect on May 29.

Great Lakes contract carriers were excluded from the previous action pending completion of a study of applications for increases in the shipping rates of iron ore, coke, coal, sand, gravel, cement and other major commodities transported by them.

Construction Steel...

New York

••• A new construction peak, as measured by the dollar volume of contracts awarded, was established in the 37 states east of the Rocky Mountains in the first half of this year, it was reported today by F. W. Dodge Corp.

The total of contracts awarded in the Eastern states was \$3,937,736,000, approximately a half billion greater than in the first half of 1928, the last previous peak year.

Residential volume contracts continued at a very high rate in June, though the total for the month was down from the phenomenal total of \$463,600,000 established in the month of May. June's residential volume was \$332,248,000.

Nonresidential construction contracts last month showed a recession from the May total of \$290,963,000 to \$273,207,000, indicating the effect of more stringent federal controls on this class of construction.

The total of all construction contracts including heavy engineering works in the Eastern states reached \$807,914,000 in June compared with \$952,418,000 in May, the Dodge report showed.

••• The estimated total bookings

••• Fabricated steel awards this week included the following:

- 1000 Tons, Chattanooga, Tenn., Nylon plant, Du Pont, to Ingalls Iron Works.
- 535 Tons, Pasadena, Tex., paper mill, Ebasco Services, to Mosher Steel Co.
- 400 Tons, San Francisco, 13 bridge cranes for Bureau of Yards & Docks, Spec. NOY 13433, to Cyclops Iron Works.
- 180 Tons, Mills County, Iowa, highway bridge, to Des Moines Steel Co.
- 150 Tons, Albany, Cal., addition to central office building, Southern California Telephone Co., to Bethlehem Pacific Coast Steel Corp., San Francisco.
- 111 Tons, Earp, Cal., switchyard, to Muskegee Iron Works.
- 100 Tons, Ida County, Iowa, highway bridge, to Des Moines Steel Co.

••• Fabricated steel inquiries this week included the following:

- 3686 Tons, Denver, penstocks, Marys Lake power plant, Bureau of Reclamation, Denver, Spec. 1347.
- 2750 Tons, Evanston, Ill., warehouse and office building, Hibbard, Spencer, Bartlett & Co.
- 500 Tons, Seattle, Wash., hangar for Northwest Airlines.
- 315 Tons, St. Louis, Mo., scales, Howe Scale Co.
- 300 Tons, Chicago, aircraft hangar.

of fabricated structural steel for the month of June, 1946, according to reports received by the American Institute of Steel Construction amounted to 128,053 tons. The estimated total for the first half of the year was 964,090 tons, or an increase of 39.5 pct over the average of 691,271 tons booked for the same period in the five prewar years 1936-40.

June shipments totaled 124,102 tons, a slight increase over the previous month. The tonnage available for future fabrication at June 30 increased to 642,359 tons.

Following is the complete tabulation of bookings and shipments:

	Estimated Total Tonnage for the Entire Industry 1946	Estimated Total Tonnage for the Entire Industry Avg. 1936-40
Contracts Closed		
Jan.	235,817	107,578
Feb.	132,707	96,280
Mar.	173,871	124,558
Apr.	128,376*	110,783
May	165,266*	126,237
June	128,053	125,835
Totals ...	964,090	691,271
Shipments		
Jan.	107,490	92,578
Feb.	63,803	88,626
Mar.	102,803	115,031
Apr.	122,305*	123,650
May	123,975*	123,225
June	124,102	129,969
Totals ...	644,478	673,079
Tonnage Available for Fabrication Within the Next Four Months	642,359	347,930

* Revised

- 227 Tons, Odair, Wash., traveling cranes, Bureau of Reclamation, Denver, Spec. 1417.
 - 160 Tons, Cache, Ill., bridge, Alexander County section 136F-2.
 - 120 Tons, Grand Coulee, Wash., coaster gate hoists, Grand Coulee pumping plant, Bureau of Reclamation, Denver, Spec. 1377.
 - 113 Tons, Coram, Cal., hydraulic gate hoists, Shasta Dam, Bureau of Reclamation, Denver, Spec. 1165.
 - 100 Tons, Bacon, Wash., Northern Pacific R. R. bridge, Columbia Basin project, Bureau of Reclamation, Denver, Spec. 1406.
- Reinforcing bar awards this week included the following:
- 1200 Tons, Whiting, Ind., building, Standard Oil, to Carnegie-Illinois Steel Corp.
 - 270 Tons, Chicago, Baskin Store, to Henry Ericsson Co.
 - 100 Tons, Sheldon Junction, Vt., bridge, to Truscon Steel Co.

••• Reinforcing bar inquiries this week included the following:

- 2618 Tons, Coram, Cal., miscellaneous bars, Bureau of Reclamation, Denver, Inv. A48,784-A.
- 2500 Tons, Chicago, subway station.
- 1538 Tons, Oakhurst, Cal., miscellaneous

- bars, Bureau of Reclamation, Denver, Inv. A-48,808-A-1, bids open Aug. 5.
- 1500 Tons, Linfield, Pa., liquor warehouse.
- 1000 Tons, Sault Ste. Marie, Mich., power house, St. Marys Falls.
- 500 Tons, Hammond, Ind., filtration plant.
- 363 Tons, Orange Cove, Cal., miscellaneous bars, Bureau of Reclamation, Denver, Inv. A-48,789-A.
- 268 Tons, Sunnyside, Wash., miscellaneous bars, Bureau of Reclamation, Denver, Inv. B-33,752-A, bids open Aug. 2.
- 200 Tons, Milwaukee, service tunnel, Blatz Brewing Co.
- 163 Tons, Martinez, Cal., miscellaneous bars, Bureau of Reclamation, Denver, Inv. A-49,094-A, bids open Aug. 5.
- 128 Tons, Granby, Colo., miscellaneous bars, Bureau of Reclamation, Denver, Inv. F-46,204-A-1, bids open Aug. 5.

••• Steel plate inquiries this week included the following:

- 6500 Tons, Grand Coulee, Wash., discharge pipes, Grand Coulee pumping plant, U. S. Bureau of Reclamation, Denver, Spec. 1338.

Coke Battery Rebuilt At C-1 Clairton Works

Clairton, Pa.

••• Completion of the rebuilding of battery No. 22 at the Clairton By-Product Coke Plant was marked by the charging of the first coal into the ovens on July 25, it was announced by Carnegie-Illinois Steel Corp., U. S. Steel subsidiary.

The new battery consists of 87 Koppers-Becker underjet type coke ovens with self-sealing doors and double collecting mains, first ovens of this type to be erected at Clairton. It has a total carbonizing capacity of 2500 tons of coal a day, while the entire Clairton plant has a daily coal coking capacity of 30,000 tons.

Now that battery No. 22 is completed, the Koppers Co., which was awarded the contract for rebuilding batteries 21 and 22, will commence rebuilding battery No. 21 immediately.

R. J. Wysor Wins Medal

Washington

••• Rufus J. Wysor, former president of the Republic Steel Corp., was presented the Medal of Freedom on July 25 by Assistant Secretary of War Howard C. Peterson for his services as chief of the Metals Section, Economics Division for the United States Military Government of Germany. Mr. Wysor was a member of the staff of Lt. Gen. Lucius D. Clay, deputy military governor of the U. S. zone in Germany, and recently returned from that country.

MACHINE TOOLS

... News and Market Activities

Market Quiet With Foreign Sales Spotty

... Machine tool production in Cincinnati will be off this week as a result of some plant vacations. During the past week, shipments have been up as a result of manufacturers pressing to clear out as many units as possible before the vacation period.

Most manufacturers report domestic orders to be exceeding foreign, and by as much as 20 pct in some instances. Generally, foreign demand has been spotty, with export buyers obtaining loans and covering their needs at once, so that subsequent business is virtually nil.

Plant operations for the most part are averaging about 18 hr daily, with a number of plants working on products other than machine tools so that a steady production rate is assured. Materials continue to be a problem, but the difficulties are not as acute as a few weeks ago.

In the East, the machine tool market is quiet, with most used machinery dealers spending much of their time attending to surplus equipment sales. Some manufacturers report that sales to customers out of the New England area are better than those to local users. Most producers have a backlog which, with few exceptions, in pre-war days would have been considered comfortable. Builders of low-priced tools are better off on a basis of backlogs, than producers of the more expensive items insofar as the number of orders on the books. In some instances, these builders have fully as much unfilled business as they did on Jan. 1, 1946.

Some builders in the East feel that domestic business is equal in volume to export, which apparently is something of a surprise. This good volume is tending to support prices at a time when it was expected that prices would begin to slip. Most current export by some companies is for South America, and many builders in the East do not expect any quick effect

on machine tool buying due to the British loan, although some secondary effects, affecting English purchases in other countries, particularly South America, willing to import British goods, may be felt.

In Detroit, except for movements of machine tools through WAA, the standard machine tool market is virtually at a standstill. Meanwhile, tool builders producing highly specialized machine tools are humming with activity and some deliveries of new materials required for present projects are scheduled as far ahead as May, 1947. A shortage of highly skilled die engineers is also tending to slow up production.

WAA has announced its intention to dispose of a number of machines gathering rust in local warehouses as scrap, but local dealers have failed to respond with much enthusiasm, knowing that many machine bases are steel and in any event, preparation costs will be high. It is expected that WAA rather than the scrap industry will benefit from the new program to the extent that it is successful.

Very little retooling is reported for 1947 models, if such there are going to be. Motor car producers are well equipped to change over to 1947 models when and if a decision is made to change. Most of the present activity is for 1948 models.

Tell Berna, general manager, the National Machine Tool Builders' Association, recently prepared a bulletin based on War Assets Administration reports as of April 28, 1946, showing that sales from surplus to date are about 21 pct of the machinery declared surplus and very approximately, 17 pct of the total that will eventually have come into the surplus pool for disposal, based on actual receipts of \$87,000,000 on machine tool sales, and \$21,000,000 from sales of other metalworking machinery, or a total of \$108,000,000.

According to WAA figures, as of

April 28, 1946, declarations of surplus machine tools, stated in original value totaled \$823,000,000, and declaration of other machinery \$280,000,000, or \$1,103,000,000 in all.

"It is estimated that this is from 80 pct to 88 pct of all metalworking machinery to be disposed of," Mr. Berna stated. "There are some minor unknown quantities, such as machines still in use under DPC leases, which may come into surplus later, and machines leased by WAA, which may later be declared."

Sales of surplus machine tools, stated in original value, total \$180,000,000; sales of other metalworking machinery, \$53,000,000, or \$233,000,000 in all. Of this total, machines having original value of \$83,000,000 were sold by contract dealers for receipts of \$39,000,000, a return of about 47 pct.

Machine tool builders who are also contract builders should be warned that if a customer secures a priority from the Civilian Production Administration for the purchase of a machine tool, no dealer commission will be paid on that sale, according to the NMTBA bulletin.

Similarly, no commission is paid on a machine purchased through the Smaller War Plants division of the RFC.

National Acme Co., Cleveland, reporting net income of \$1,159,332 for the first six months of 1946, has purchased the DPC plant it operated during the war from War Assets Administration for \$40,000 and will begin production of small tools about October 1, augmenting present production. Among the products to be manufactured in the new plant will be some special small items for Sears, Roebuck & Co., for which National Acme recently received orders totaling approximately \$2,500,000.

F. H. Chapin, president of National Acme, said acquisition of the plant is in keeping with the company's plan to broaden the scope of its operations outside the automatic machine tool field.

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NONFERROUS METALS

... News and Market Activities

Sees Prewar Tin Production Rate in 1949

Washington

... The prewar rate of world tin production will not be reached until some time in 1949, according to a special report by John J. Croston, who recently visited the Far Eastern tin producing areas as a special investigator for CPA. Only about 41,000 tons of tin were located in the Orient, which is normally the source of 70 pct of the world's tin supply. This amount is approximately 3 month's world consumption at the present rate.

The poor condition of the Far Eastern tin mines will limit 1946 production to approximately 24,000 tons in 1946, compared with a peacetime production in the Orient of over 160,000 tons, Mr. Croston said. The 1947 rate will be only about one-half of the peacetime rate, and even in 1948 and 1949 may not reach a prewar basis. Political unrest, inadequate food supplies and lack of proper working conditions are contributing factors in the expected production lag.

Mr. Croston's report on tin supplies, broken down by areas, was as follows:

NETHERLANDS EAST INDIES—200 tons of tin metal (pigs and boxes) were uncovered on the island of Java. Billiton stocks were approximately 300 tons tin content concentrates; Banka stocks approximately 6000 tons, half pig tin, half concentrates. Total anticipated output of Banka, Billiton and Singkep in 1946 is about 7200 tons, rising to 32,100 tons in 1947 and 47,500 tons in 1948 and thereafter.

MALAYA—Stocks were approximately 4500 tons metal and 6000 tons concentrates. Anticipated output for 1946 is approximately 12,300 tons. In 1947 the production should reach 46,150 tons and 72,800 tons in 1948. Malaya will prob-

ably not reach over 90 pct of prewar peak, which was 85,000 tons in 1940.

SIAM—Stocks were approximately 15,000 tons total in pig tin and concentrates. Present "guesstimates" for 1946 output is 1400 tons, for 1947 between 6000 and 7000 tons, rising to 13,000 tons in 1948 and to 17,000 tons by 1949. This is approximately the prewar peak.

BURMA—Peacetime tin production was about 6000 tons annually, but output in 1946 is expected to be negligible.

CHINA—Prewar output was 12,000 tons annually, but 1946 production will be about 2500 tons.

FRENCH INDO-CHINA—This country is expected to reach in 1946 approximately one-half its normal peacetime production of 2000 tons annually.

JAPAN—Surplus pig tin stocks were about 10,000 tons and are now being shipped to the United States for allocation by the Combined Tin Board. Stocks in Japan, plus small production there, may be sufficient to keep Japanese industries operating on a non-military basis for several years, Mr. Croston reported.

Lead

... Producers are selling lead based on the OPA price as of the day of shipment. With the price rolled back by OPA, there was a drop Friday from 9.35¢ per lb to 8.10¢ per lb, East St. Louis. During the lapse of OPA, scrap lead is reported to have flooded into the smelters whose scrap buying prices were based on the increased prices for primary metals. Now it is questionable whether smelters will be willing to release refined lead at the current lowered OPA ceiling and thereby sustain a significant loss. It is probable, therefore, that remelted lead will not be placed on the market until the OPA increases ceiling prices for the metal.

This question is significant in affecting the tonnage of available lead which in August will not exceed one quarter of requirements.

However, the opinion has been hazarded by a member of the industry that some water might be squeezed out of these requirements.

Zinc

... Producers are selling zinc priced as of the day of shipment with a drop in price last Friday to the former OPA ceiling of 8.25¢ per lb, East St. Louis. Shortages continue to exist in Prime Western and Special High Grade.

The effect of the establishment of export controls on slab zinc has immediately become apparent to the industry. Foreign consumers have been paying the full domestic price for the metal and producers have been realizing 0.75¢ per lb for the metal. Foreign consumers have apparently been willing to take all grades of zinc and demand is rapidly becoming a significant factor in the market particularly with the unbalanced supply position at the present time.

Antimony

... With the return of OPA the price of the metal f.o.b. Laredo, Tex., has been rolled back to 14.50¢ per lb. The plant of one refiner is closed down due to a labor shortage.

Cadmium

... Return of the OPA to effective action saw, instead of a price roll-back for this metal, decontrol action and producers may continue to sell cadmium at the increased price of \$1.25 per lb. The previous OPA ceiling price had been 90¢ per lb, which was abandoned as soon as OPA became ineffective. The metal continues in short supply although the higher price has been responsible for somewhat easier position.

Silver

... The principal silver dealer in New York has temporarily lapsed quotation in the metal since the return of OPA and the former OPA ceiling price. At the present time no business in silver is being transacted.

Nonferrous Metals Prices

Cents per pound

	July 24	July 25	July 26	July 27	July 29	July 30
Copper, electro., Conn.	14.375	14.375	14.375	14.375	14.375	14.375
Copper, Lake, Conn.	14.375	14.375	14.375	14.375	14.375	14.375
Tin, Straits, New York	52.00	52.00	52.00	52.00	52.00	52.00
Zinc, East St. Louis	9.50	9.50	8.25	8.25	8.25	8.25
Lead, St. Louis	9.35	9.35	8.10	8.10	8.10	8.10

NONFERROUS PRICES

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb)	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American, Laredo, Tex.	14.50
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	\$14.75
Beryllium aluminum, 5% Be; dollars per lb contained Be	\$30.00
Cadmium, del'd	\$1.25
Cobalt, 97-99% (per lb)	\$1.50 to \$1.57
Copper, electro, Conn. Valley	14.375
Copper, electro, New York	14.125
Copper, lake, Conn. Valley	14.375
Gold, U. S. Treas., dollars per troy oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$ 2.25
Iridium, dollars per troy oz.	\$125.00
Lead, St. Louis	8.10
Lead, New York	8.25
Magnesium, 99.9 + %, carlots	20.50
Magnesium, 12-in. sticks, carlots	27.50
Mercury, dollars per 76-lb flask, f.o.b. New York	\$99 to \$100
Nickel, electro, f.o.b. refinery	35.00
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$70.00
Silver, New York, cents per oz.	90.125
Tin, Straits, New York	52.00
Zinc, East St. Louis	8.25
Zinc, New York	8.69
Zirconium copper, 6 pct Zr, per lb contained Zr	\$ 6.00

Remelted Metals

(Cents per lb)

Aluminum, No. 12 Fdy. (No. 2)	11.50 to 12.00
Aluminum, deoxidizing	
No. 2	12.50
No. 3	11.50
No. 4	10.50
Brass Ingot—ceiling prices	
85-5-5-5 (No. 115)	15.50
88-10-2 (No. 215)	18.75
80-10-10 (No. 305)	18.25
No. 1 Yellow (No. 405)	12.50

Copper, Copper Base Alloys

(Mill base, cents per lb)

	Extruded shapes	Rods	Sheets
Copper	25.66	25.81	
Copper, H.R.	22.16		
Copper drawn	23.16		
Low brass, 80%	24.35	24.66	
High brass		24.38	
Red brass, 85%	24.67	24.98	
Naval brass	23.84	22.59	28.53
Brass, free cut		18.53	
Commercial, bronze		25.50	25.81
Manganese bronze	27.45	25.95	32.03
Phosphor bronze, A,			
B, 5%	43.68	43.43	
Muntz metal	23.59	22.34	26.78
Everdur, Herculoy,			
Olympic or equal	29.82	30.88	
Nickel silver, 5%		34.44	32.38
Architectural bronze	22.50		

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢; 52S-O, 67¢ 24S-T, 71¢; base, 30,000 lb.

Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢; 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb and over.

Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb and over.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4: 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 27.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢ 1 in., 2 in., 27¢; base, 5000 lb. Rod: 2S, 3S, 1¼ to 2½ in.

(Continued, See Next Column)

diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. Round Wire: drawn, coiled, B & S gage 17-18: 2S, 3S, 33.5¢; 56S, 49.5¢; 10,000 lb base: B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢; B & S 15-16: 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

NONFERROUS SCRAP METAL QUOTATIONS

Copper, Copper Base Alloys

OPA Group 1

No. 1 wire, No. 1 heavy copper	12.50
No. 1 tinned copper wire, No. 1	
unlined heavy copper	14.50
No. 2 wire, mixed heavy copper	11.50
Copper tuyeres	11.50
Light copper	10.50
Copper borings, No. 1	12.50
No. 2 copper borings	11.50
Lead covered copper wire, cable	
Lead covered telephone, power cable	
Insulated copper	

OPA Group 2

Bell metal	18.25
High grade bronze gears	16.00
High grade bronze solids	
Low lead bronze borings	
Babbitt lined brass bushings	15.75
High lead bronze solids	
High lead bronze borings	
Red trolley wheels	13.50
Tinny (phosphor bronze) borings	13.25
Tinny (phosphor bronze) solids	13.25
Copper-nickel solids and borings	12.00
Bronze paper mill wire cloth	12.25
Aluminum bronze solids	11.75
Soft red brass (No. 1 composition)	12.00
Soft red brass borings (No. 1)	12.00*
Gilding metal turnings	11.25
Contaminated gilded metal solids	11.25
Unlined standard red car boxes	11.00
Lined standard red car boxes	10.50
Cocks and faucets	10.50
Mixed brass screens	10.50
Red brass breakage	10.25
Old nickel silver solids	8.60
Old nickel silver borings	8.50
Copper lead solids, borings	7.75
Yellow brass castings	8.25
Automobile radiators	9.75
Zincy bronze solids, borings	10.75

OPA Group 3

Fired rifle shells	10.25
Brass pipe	10.50
Old rolled brass	9.00
Admiralty condenser tubes	9.50
Muntz metal condenser tubes	9.00
Plated brass sheet, pipe reflectors	8.50
Manganese bronze solids	8.75 ¹
Manganese bronze solids	7.75 ²
Manganese bronze borings	8.00

OPA Group 4

Refinery brass	6.75*
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*Price varies with analysis. ¹Lead content 0.00 to 0.40 pct. ²Lead content 0.41 to 1.00 pct.

Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotations. Metal turnings: 100 lb or more, 46¢ a lb; 25 to 90 lb, 56¢; less than 25 lb, 66¢.

Brass Mill Scrap

Briquetted cartridge brass turnings	10.375
Cartridge brass turnings, loose	9.625
Loose yellow brass trimmings	9.625

Aluminum

Plant scrap, segregated

2S solids	8.50 to 9.00
Dural alloys, solids 14, 17, 18, 24S, 25S	6.00 to 6.25
turnings, dry basis	1.50 to 1.75
Low copper, alloys 51, 52, 61, 63S solids	8.00 to 8.50
turnings, dry basis	5.00 to 6.50

Plant scrap, mixed

Solids	4.25 to 4.50
Turnings, dry basis	1.50 to 1.75

Obsolete scrap

Pure cable	6.50 to 7.50
Old sheet and utensils	5.00 to 5.50
Old castings and forgings	5.00 to 5.50
Pistons, free of struts	4.00 to 4.50
Pistons, with struts	2.50 to 3.00
Old alloy sheet	2.00 to 2.50

Magnesium*

Segregated plant scrap

Pure solids and all other solids, exempt Borings and turnings	*1.50
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Mixed, contaminated plant scrap

Grade 1 solids	3.00
Grade 1 borings and turnings	2.00
Grade 2 solids	2.00
Grade 2 borings and turnings	1.00

*Nominal.

Zinc

New zinc clippings, trimmings	7.50
Engravers, lithographers plates	7.50
Old zinc scrap	5.75
Unswaged zinc dross	6.00
Die cast slab	5.50
New die cast scrap	5.45
Radiator grilles, old and new	4.50
Old die cast scrap	4.00

Lead

Deduct 1.40¢ a lb from refined metal basing point prices for refinery charge on used battery plates.

Soft lead scrap	7.50
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Nickel

Ni content 98+%, Cu under ¼%, 23¢ per lb; 90 to 98% Ni, 23¢ per lb contained Ni.

ELECTROPLATING ANODES AND CHEMICALS

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	29.75
Electrodeposited	23.47
Rolled, oval, straight	23.97
Curved, 18 in. or longer	23.97
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	27.25
Zinc, cast, 99.99, 15 in. or longer	16¼
Nickel, 99 pct plus, frt. allowed	
Cast	47
Rolled, depolarized	48
Silver, 999 fine	
Rolled, 100 oz. lots, per oz.	80%

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 1-5 bbls	34.00
Copper sulphate, 99.5, crystals, bbls	7.75
Nickel salts, single, 425 lb bbls, frt. allowed	13.50
Silver cyanide, 100 oz lots, per oz.	0.655
Sodium cyanide, 96 pct, domestic, 100 lb drums	15.00
Zinc cyanide, 100 lb drums	33.00
Zinc sulphate, 89 pct, crystals, bbls, frt. allowed	6.35

SCRAP

... News and Market Activities

OPA Denies Price Increase, Blasts Dealers

Washington

• • • Re-affirming earlier statements, OPA, on July 27, emphasized that ceiling prices for iron and steel scrap are adequate and that no increase will be granted in the foreseeable future.

Like other products remaining under price control maximum prices for iron and steel scrap in effect June 30, 1946 were restored when the new control act became effective on July 25, OPA said.

In its statement, OPA again charged scrap dealers with holding back stocks in the belief that a price increase was on the way. The price agency said that its July 27 announcement should result in the release of scrap that has been withheld.

PITTSBURGH—The market situation continues as tight as before the short-lived interment of OPA. Cast scrap, which sold during the past couple of weeks at over the ceiling prices in some instances, finds its price rolled back to the \$20 ceiling. However, dealers shipped as much cast as possible before OPA was revitalized, so a slow down of cast shipments because of scarcity of supply is almost inevitable. With steel operating rates here pushing 100 pct, there is a probability that openhearthers will have to be slowed down for lack of scrap. Production scrap lists, especially Detroit, are looking better each week, but as yet not much of this material has moved into Pittsburgh.

CHICAGO—Sellers here point out that shipments reflect fundamental economic principles which have always disregarded theory so that as long as the collectors of scrap remain indifferent the shortage will exist. Producers are barely receiving enough to hold the present operating rate. Brokers report shipments on old contracts are as much as 50 pct or more off the pace originally intended and that the yards refuse to unduly bestir themselves because of inadequate prices. Scrap is moving but only in small enough quantities to maintain fair business relations.

PHILADELPHIA—The return of OPA is not expected by dealers and brokers to make any difference in the low level of shipments of steel scrap to mills. Several mills are reported in desperate need of scrap, although coming furnace close-downs will more than likely be caused directly by a shortage of pig iron which certain mills report to be even worse. The OPA roll back has re-established cast cell-

ings at \$20, a drop of \$8.50 from the free market price. Market observers are of the opinion that there will be a return of the manipulations which featured the cast market before lapse of OPA.

DETROIT—Opinion here is divided as to the effect of the reinstatement of OPA ceilings. Some hold that the end of price uncertainty will bring out some scrap which has been held for a quick rise in prices; others feel that as long as dealers are not regulated as to the price they can pay for scrap handled through a yard it will be profitable both in the long term and short term to withhold scrap from the market. It is agreed that OPA's recent denial will halt any possibility that may have existed for bringing marginal scrap back into the market. Isolated sales of sheet clips to dealers are reported at \$15 to \$16 and one offering of automobile turnings recently brought \$14.55. Nearly all scrap generated by auto plants is being directed to specified steel mills.

BOSTON—The orgy of spending for cast is over and the market back on the former OPA ceiling level. How hungry some melters were is shown by sales of strictly No. 1 machinery cast at \$44.50 a ton; truckloads of ordinary cast at \$35 a ton, and carlots at \$30; heavy breakable at \$30.10 and small lots of low phos at prices \$5 to \$10 a ton above ceilings. A surprisingly large tonnage of cast came out at the higher prices. Other grades of scrap were and are inactive with no transactions at above ceiling prices.

NEW YORK—Movement of foundry grades slowed somewhat after last week's \$28 delivered price momentarily increased the volume moved. Observers doubt that the price rise caused any overall increase in volume; rather, it momentarily changed the distribution pattern. Steelmaking grades are moving at less than half the normal rate. Some railroads and some dealers are still holding material in hopes of a price increase.

BUFFALO—Revival of price controls renewed the pressure for higher ceilings and pinched off still more of the meager supplies that had been moving into consuming channels while sham free market conditions prevailed. Many collectors have taken the stand they have nothing to lose and everything to gain by waiting at this time. A leading dealer said that 20 to 25 pct of his supply normally comes from collectors and, until thawed out by means of higher prices, this flow will be limited. Prohibitive labor costs, he added, have barred a resumption of auto scrap-ping operations. As a result, brokers and dealers are wary of new commitments and deliveries are confined to old orders.

ST. LOUIS—The movement of scrap iron to the St. Louis industrial district was as light as it was during the suspension of the OPA the early part of the week and not much improvement is expected for a while. It is expected that some dealers will move a few cars but it is believed that they will continue to hold on to their supplies in hope of getting an increase from the OPA. Railroad lists include Wabash, 2000 tons and St. Louis-San Francisco, 33 carloads.

CINCINNATI—There is no change in the tightness of the iron and steel scrap markets in this area. One or two mills in the area indicate inventory of approximately 30 days, while another steel mill indicates that it is unloading scrap directly from the freight cars into the furnace charging blocks. Foundries, too, are clamoring for more scrap, but yard supplies continue to be low. Extent of hoarding, in anticipation of the price rise, is undetermined although some scrap dealers and brokers feel that this may be a sound influence in the present period of scarcity.

CLEVELAND—Reincarnation of OPA has had little effect on the scrap market here. Shipments are improved but with few exceptions most of the tonnage being held for higher prices was released before OPA's return. Some foundries are in bad shape on cast but so little good material is available that it is questionable whether higher prices would affect the supply. Key to the scrap situation here is the lack of concurrence between industrial production and steel output. Mills are producing at about 85 pct and many industrial plants around 35 pct, which harkens back to the winter of 41-42 when blast furnaces were taken off for lack of scrap with many of the newly built war plants not fully in production and accordingly not in a position to return much scrap.

TORONTO—While the strikes at the three big basic steel plants have relieved some of the pressure on dealers, the slow-down in deliveries has not been reflected in any slackening in demand. During the past week or 10 days there has been noticeable falling off in scrap offerings from industrial plants, which is chiefly due to slackening in operations through shortage of steel. Demand for iron scrap has jumped sharply as foundry melters are endeavoring to obtain cast and stove plate to replace pig iron with supplies of the latter dried up insofar as the big producers are concerned.

Luria Steel Opens in Boston

Boston

• • • Luria Steel & Trading Corp. has announced the opening of a New England office at 53 State St., Boston. Mr. M. F. Luria will be in charge.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$20.00*
RR. hvy. melting	21.00*
No. 2 hvy. melting	20.00*
RR. scrap rails	21.50*
Rails 3 ft. and under	23.50*
No. 1 comp'd sheets	20.00*
Hand bldd. new shts.	20.00*
Hvy. axle turn.	19.50*
Hvy. steel forge turn.	19.50*
Mach. shop turn.	15.00*
Short shov. turn.	17.00*
Mixed bor. and turn.	15.00*
Cast iron borings	16.00*
Hvy. break cast.	16.50*
No. 1 cupola	20.00*
RR. knuck. and coup.	24.50*
RR. coil springs	24.50*
Rail leaf springs	24.50*
Roller steel wheels	24.50*
Low phos. bil. crops	25.00*
RR. malleable	22.50*
RR. malleable	22.00*

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$18.75*
No. 2 hvy. melting	18.75*
No. 1 bundles	18.75*
No. 2 dealers' bndls.	18.75*
Bundled mach. shop turn.	18.75*
Galv. bundles	16.75*
Mach. shop turn.	13.75*
Short shovels, turn.	15.75*
Cast iron borings	14.75*
Mix. borings & turn.	13.75*
Low phos. hvy. forge	23.75*
Low phos. plates	21.25*
No. 1 RR. hvy. melt.	19.75*
Reroll rails	22.25*
Miscellaneous rails	20.25*
Angles & splice bars	22.25*
Locomotive tires, cut	24.25*
Cut bolsters & side frames	22.25*
Standard stl. car axles	25.75*
No. 3 steel wheels	23.25*
Couplers & knuckles	23.25*
Agricul. malleable	22.00*
RR. malleable	22.00*
No. 1 mach. cast.	20.00*
Rails 3 ft. and under	22.25*
No. 1 agricul. cast.	20.00*
Hvy. breakable cast.	16.50*
RR. grate bars	15.25*
Cast iron brake shoes	15.25*
Stove plate	19.00*
Clean auto cast.	20.00*
Cast iron carwheels	20.00*

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.50*
No. 2 hvy. melting	19.50*
No. 1 bundles	19.50*
No. 2 bundles	19.50*
Mach. shop turn.	\$10.50 to 11.00
Shoveling turn.	12.50 to 13.00
Cast iron borings	11.50 to 12.00
Mixed bor. & turn.	11.50 to 12.00
Low phos. plate	22.00*
No. 1 cupola cast.	20.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Scrap rails	21.00*

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars

No. 1 hvy. melting	\$15.05*
No. 2 hvy. melting	15.05*
Nos. 1 and 2 bundles	15.05*
Bushellings	15.05*
Turnings, shovellings	12.05*
Machine shop turn.	10.05*
Mixed bor. & turn.	10.05*
Cl'n cast. chem. bor.	\$13.06 to 14.15*
Machinery cast	20.00*
Breakable cast.	16.50*
Stove plate	19.00*

DETROIT

Per gross ton, brokers' buying prices:

No. 1 hvy. melting	\$17.32*
No. 2 hvy. melting	17.32*
No. 1 bundles	17.32*
New bushelling	17.32*
Flashings	17.32*
Mach. shop turn.	12.32*
Short shov. turn.	14.32*

Going prices as obtained in the trade by IRON AGE editors, based on representative tonnages. Where asterisks are used they indicate the OPA ceiling price to which must be added brokerage fee and adjusted freight.

Cast iron borings	13.32*
Mixed bor. & turn.	12.32*
Low phos. plate	19.82*
No. 1 cupola cast.	20.00*
Charging box cast.	19.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Automotive cast.	20.00*

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$18.75*
No. 2 hvy. melting	18.75*
No. 2 bundles	18.75*
Mach. shop turn.	13.75*
Shovelling turn.	15.75*
Cast iron borings	14.75*
Mixed bor. & turn.	13.75*
No. 1 cupola cast.	20.00*
Hvy. breakable cast.	16.50*
Cast, charging box	19.00*
Hvy. axle forge turn.	19.25*
Low phos. plate	21.25*
Low phos. punchings	21.25*
Billet crops	21.25*
RR. steel wheels	23.25*
RR. coil springs	23.25*
RR. malleable	22.00*

ST. LOUIS

Per gross ton delivered to consumer:

Heavy melting	\$17.50*
Bundled sheets	17.50*
Mach. shop turn.	12.50*
Locomotive tires, uncut	21.00*
Misc. std. sec. rails	19.00*
Rerolling rails	21.00*
Steel angle bars	21.00*
Rails 3 ft. and under	21.50*
RR. springs	22.00*
Steel car axles	24.50*
Stove plate	19.00*
Grate bars	15.25*
Brake shoes	15.25*
RR. malleable	22.00*
Cast iron carwheels	20.00*
No. 1 mach'ery cast	20.00*
Breakable cast.	16.50*

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$17.00*
No. 2 hvy. melting	17.00*
No. 2 bundles	17.00*
No. 1 bushelling	17.00*
Long turnings	12.00*
Shovelling turnings	14.00*
Cast iron borings	13.00*
Bar crops and plate	\$18.50 to 19.50*
Structural and plate	18.50 to 19.50*
No. 1 cast	20.00*
Stove plate	19.00*
Steel axles	18.50*
Scrap rails	18.50*
Rerolling rails	20.50*
Angles & splice bars	20.50* to 21.00*
Rails 3 ft. & under	21.00*
Cast iron carwheels	17.50 to 18.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$20.00*
No. 2 hvy. melting	20.00*
Low phos. plate	22.50*
No. 1 bushelling	20.00*
Hydraulic bundles	20.00*
Mach. shop turn.	15.00*
Short shov. turn.	17.00*
Cast iron borings	16.00*

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$15.33*
No. 2 hvy. melting	15.33*
Comp. black bundles	15.33*
Comp. galv. bundles	13.33*
Mach. shop turn.	10.33*
Mixed bor. & turn.	10.33*
Shovelling turn.	12.33*
No. 1 cupola cast.	20.00*

Hvy. breakable cast	16.50*
Charging box cast	19.00*
Stove plate	19.00*
Clean auto cast	20.00*
Unstrip. motor blks.	17.50*
Cl'n chem. cast bor.	14.33*

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.25*
No. 1 bundles	19.25*
No. 2 bundles	19.25*
No. 2 hvy. melting	19.25*
Mach. shop turn.	14.25*
Shovelling turn.	16.25*
Cast iron borings	14.25*
Cast iron borings	15.25*
Mixed bor. & turn.	14.25*
Stove plate	19.00*
Low phos. plate	21.75*
Scrap rails	20.75*
Rails 3 ft. & under	22.75*
RR. steel wheels	23.75*
Cast iron car wheels	20.00*
RR. coil & leaf spgs.	23.75*
RR. knuckles & coup.	23.75*
RR. malleable	22.00*
No. 1 bushelling	19.25*

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.50*
No. 2 hvy. melting	19.50*
Compressed sheet stl.	19.50*
Drop forge flashings	19.00*
No. 2 bundles	19.50*
Mach. shop turn.	14.50*
Short shov. turn.	16.50*
No. 1 bushelling	19.50*
Steel axle turn.	19.00*
Low phos. billet and bloom crops	24.50*
Cast iron borings	15.50*
Mixed bor. & turn.	14.50*
No. 2 bushelling	17.00*
No. 1 machine cast	20.00*
Railroad cast	20.00*
Railroad grate bars	15.25*
Stove plate	19.00*
RR. hvy. melting	20.50*
Rails 3 ft. & under	23.00*
Rails 18 in. & under	24.25*
Rails for rerolling	23.00*
Railroad malleable	22.00*
Elec. furnace punch	22.00*

SAN FRANCISCO

Per gross ton delivered to consumer:

RR. hvy. melting	\$18.00*
No. 1 hvy. melting	17.00*
No. 2 hvy. melting	17.00*
No. 2 bales	\$15.00 to 15.75
No. 3 bales	8.50 to 9.25
Mach. shop turn.	6.50 to 7.25
Elec. furn. 1 ft. und.	15.50 to 17.00
No. 1 cupola cast.	19.00 to 21.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$17.00*
No. 2 hvy. melting	17.00*
No. 1 bales	\$16.00 to 17.00
No. 2 bales	15.50 to 16.00
No. 3 bales	8.00 to 9.00
Mach. shop turn.	7.00
No. 1 cupola cast.	19.00 to 21.00

SEATTLE

Per gross ton delivered to consumer:

RR. hvy. melting	\$14.50*
No. 1 & No. 2 hvy. melting	14.50*
Elec. furn. 1 ft. und.	\$14.00 to 15.00
No. 1 cupola cast.	20.00*

HAMILTON, ONT.

Per gross ton delivered to consumer:

Heavy melting	\$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scrap	15.50*
Rails, remelting	18.50*
Rails, rerolling	21.50*
Bushellings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*

Comparison of Prices . .

Advances over past week in Heavy Type; declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel:	July 30, 1946	July 23, 1946	June 25, 1946	July 31, 1945
(cents per pound)	1946	1946	1946	1945
Hot-rolled sheets	2.425	2.425	2.425	2.20
Cold-rolled sheets	3.275	3.275	3.275	3.05
Galvanized sheets (24 ga.)	4.05	4.05	4.05	3.70
Hot-rolled strip				
6-in. and under	2.45	2.45	2.45	2.10
Over 6 in.	2.35	2.35	2.35	2.10
Cold-rolled strip	3.05	3.05	3.05	2.80
Plates	2.50	2.50	2.50	2.25
Plates, wrought iron	4.112	4.112	4.112	3.80
Stain's c-r strip (No. 302)	30.30	30.30	30.30	28.00

Tin and Terneplate:	July 30, 1946	July 23, 1946	June 25, 1946	July 31, 1945
(dollars per base box)				
Tinplate, standard cokes.	\$5.00	\$5.00	\$5.00	\$5.00
Tinplate, electro (0.50 lb)	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.55	4.55	4.55	4.30

Bars and Shapes:	July 30, 1946	July 23, 1946	June 25, 1946	July 31, 1945
(cents per pound)				
Merchant bars	2.50	2.50	2.50	2.25
Cold-finished bars	3.10	3.10	3.10	2.65
Alloy bars	2.92	2.92	2.92	2.70
Structural shapes	2.35	2.35	2.35	2.10
Stainless bars (No. 302)	25.97	25.97	25.97	24.00
Wrought iron bars	4.76	4.76	4.76	4.40

Wire and Wire Products:	July 30, 1946	July 23, 1946	June 25, 1946	July 31, 1945
(cents per pound)				
Bright wire	3.05	3.05	3.05	2.75
Wire nails	3.75	3.75	3.25	2.90

Rails:	July 30, 1946	July 23, 1946	June 25, 1946	July 31, 1945
(dollars per net ton)				
Heavy rails	\$43.39	\$43.39	\$43.39	\$43.00
Light rails	49.18	49.18	49.18	45.00

Semifinished Steel:	July 30, 1946	July 23, 1946	June 25, 1946	July 31, 1945
(dollars per gross ton)				
Rerolling billets	\$39.00	\$39.00	\$39.00	\$36.00
Sheet bars	38.00	38.00	38.00	36.00
Slabs, rerolling	39.00	39.00	39.00	36.00
Forging billets	47.00	47.00	47.00	42.00
Alloy blooms, billets, slabs	58.43	58.43	58.43	54.00

Wire Rods and Skelp:	July 30, 1946	July 23, 1946	June 25, 1946	July 31, 1945
(cents per pound)				
Wire rods	2.30	2.30	2.30	2.15
Skelp	2.05	2.05	2.05	1.90

Pig Iron*:	July 30, 1946	July 23, 1946	June 25, 1946	July 31, 1945
(per gross ton)	1946	1946	1946	1945
No. 2 foundry, Phila.	\$30.34	\$30.34	\$30.34	\$26.84
No. 2, Valley furnace	28.50	28.50	28.50	25.00
No. 2, Southern, Cin'ti	28.94	28.94	28.94	25.44
No. 2, Birmingham	24.88	24.88	24.88	21.38
No. 2 foundry, Chicago†	28.50	28.50	28.50	25.00
Basic, del'd eastern Pa.	29.84	29.84	29.84	26.34
Basic, Valley furnace	28.00	28.00	28.00	24.50
Malleable, Chicago†	28.50	28.50	28.50	25.00
Malleable, Valley	28.50	28.50	28.50	25.00
L. S. charcoal, Chicago	42.34	42.34	42.34	42.34
Ferromanganese‡	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is 60¢ per ton.

‡ For carlots at seaboard.

* Prices retroactive to May 29; the price increase should be reflected in THE IRON AGE Comparison of Prices table since June 4.

Scrap:	July 30, 1946	July 23, 1946	June 25, 1946	July 31, 1945
(per gross ton)				
Heavy melt'g steel, P'gh.	\$20.00	\$20.00	\$20.00	\$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.32	17.32	17.32	17.32
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia	20.00	28.50	20.00	20.00
No. 1 cast, Chicago	20.00	20.00	20.00	20.00

Coke, Connellsville:	July 30, 1946	July 23, 1946	June 25, 1946	July 31, 1945
(per net ton at oven)				
Furnace coke, prompt	\$8.75	\$8.75	\$7.50	\$7.50
Foundry coke, prompt	9.85	9.85	9.00	9.00

Nonferrous Metals:	July 30, 1946	July 23, 1946	June 25, 1946	July 31, 1945
(cents per pound to large buyers)				
Copper, electro., Conn.	14.375	14.375	14.375	12.00
Copper, Lake, Conn.	14.375	14.375	14.375	12.00
Tin, Straits, New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	8.25	9.50	8.25	8.25
Lead, St. Louis	8.10	9.50	8.10	6.35
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	14.50	14.50	14.50	14.50

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite prices for the current quarter are an estimate based on finished steel shipments for the previous quarter. These figures will be revised when the actual data of shipments for this quarter are compiled.

Composite Prices . .

FINISHED STEEL

July 30, 1946	2.72115¢ per lb.
One week ago	2.72115¢ per lb.
One month ago	2.72115¢ per lb.
One year ago	2.44076¢ per lb.

	HIGH	LOW
1946.....	2.72115¢ Apr. 2	2.54490¢ Jan. 1
1945.....	2.44104¢ Oct. 2	2.38444¢ Jan. 2
1944.....	2.30837¢ Sept. 5	2.21189¢ Oct. 5
1943.....	2.29176¢	2.29176¢
1942.....	2.28249¢	2.28249¢
1941.....	2.43078¢	2.43078¢
1940.....	2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939.....	2.35367¢ Jan. 3	2.26689¢ May 16
1938.....	2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937.....	2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936.....	2.32263¢ Dec. 28	2.05200¢ Mar. 10
1935.....	2.07642¢ Oct. 1	2.06492¢ Jan. 8
1934.....	2.15367¢ Apr. 24	1.95757¢ Jan. 2
1933.....	1.95578¢ Oct. 3	1.75836¢ May 2
1932.....	1.89196¢ July 5	1.83901¢ Mar. 1
1931.....	1.99626¢ Jan. 13	1.86586¢ Dec. 29
1930.....	2.25488¢ Jan. 7	1.97319¢ Dec. 9
1929.....	2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 pct of the United States output. Index recapitulated in Aug. 28, 1941, issue.

PIG IRON

.....	\$28.12 per gross ton.....
.....	\$28.12 per gross ton.....
.....	\$28.12 per gross ton.....
.....	\$24.61 per gross ton.....

	HIGH	LOW
.....	\$28.12 May 29	\$25.37 Jan. 1
.....	25.37 Oct. 23	23.61 Jan. 2
.....	\$23.61	\$23.61
.....	23.61	23.61
.....	23.61	23.61
.....	\$23.61 Mar. 20	\$23.45 Jan. 2
.....	23.45 Dec. 23	22.61 Jan. 2
.....	22.61 Sept. 19	20.61 Sept. 12
.....	23.25 June 21	19.61 July 6
.....	23.25 Mar. 9	20.25 Feb. 16
.....	19.74 Nov. 24	18.73 Aug. 11
.....	18.84 Nov. 5	17.83 May 14
.....	17.90 May 1	16.90 Jan. 27
.....	16.90 Dec. 5	13.56 Jan. 3
.....	14.81 Jan. 5	13.56 Dec. 6
.....	15.90 Jan. 6	14.79 Dec. 15
.....	18.21 Jan. 7	15.90 Dec. 16
.....	18.71 May 14	18.21 Dec. 17

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo Valley and Birmingham.

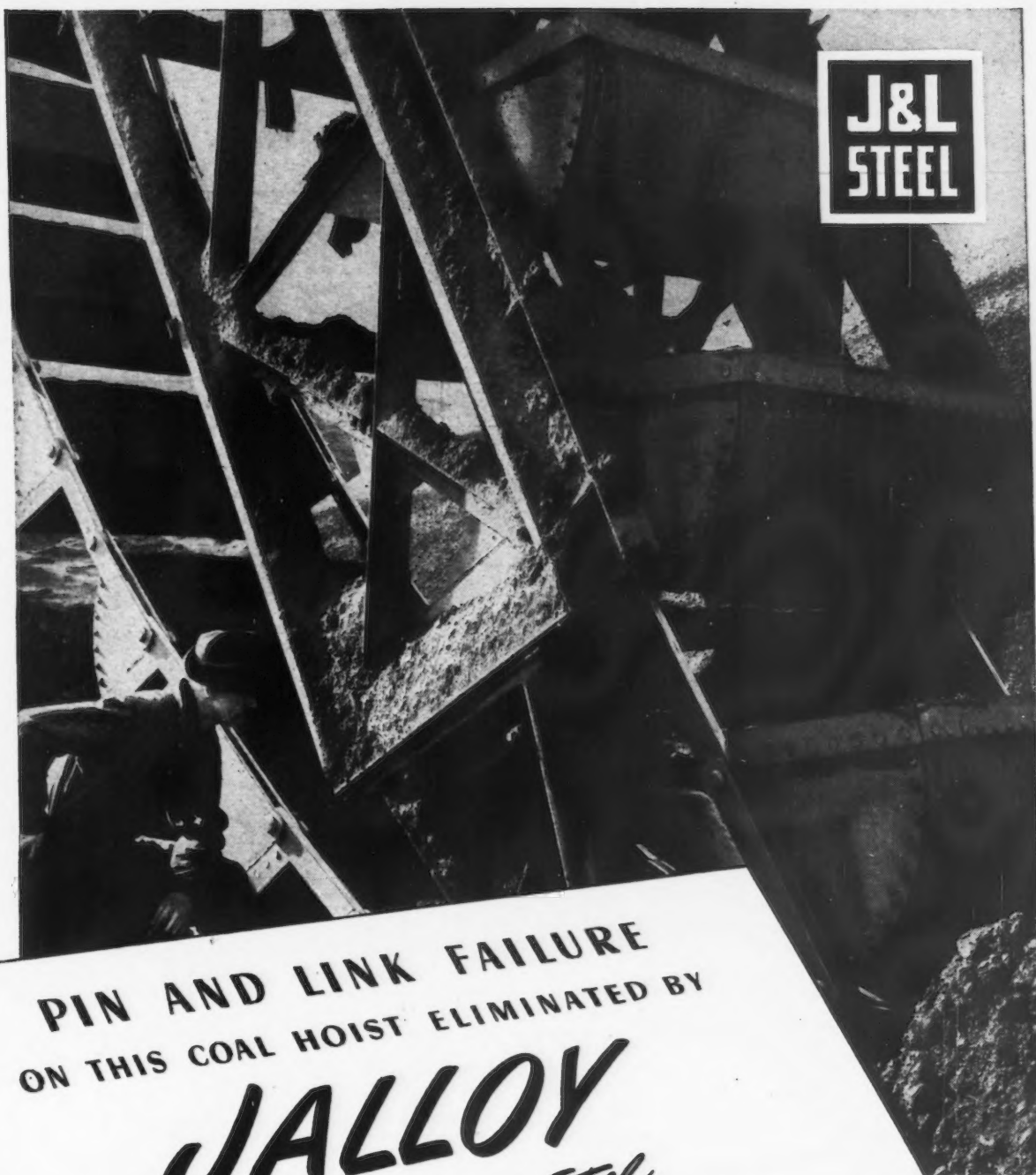
SCRAP STEEL

.....	\$19.17 per gross ton.....
.....	\$19.17 per gross ton.....
.....	\$19.17 per gross ton.....
.....	\$19.17 per gross ton.....

	HIGH	LOW
.....	\$19.17	\$19.17
.....	\$19.17 Jan. 2	\$18.92 May 22
.....	19.17 Jan. 11	15.76 Oct. 24
.....	\$19.17	\$19.17
.....	19.17	19.17
.....	\$22.00 Jan. 7	\$19.17 Apr. 10
.....	21.83 Dec. 30	16.04 Apr. 9
.....	22.50 Oct. 3	14.08 May 16
.....	15.00 Nov. 2	11.00 June 7
.....	21.92 Mar. 30	12.67 June 9
.....	17.75 Dec. 21	12.67 June 8
.....	13.42 Dec. 10	10.33 Apr. 29
.....	13.00 Mar. 13	9.50 Sept. 25
.....	12.25 Aug. 8	6.75 Jan. 3
.....	8.50 Jan. 12	6.43 July 5
.....	11.33 Jan. 6	8.50 Dec. 29
.....	15.00 Feb. 18	11.25 Dec. 9
.....	17.58 Jan. 29	14.08 Dec. 3

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

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**J&L
STEEL**

**PIN AND LINK FAILURE
ON THIS COAL HOIST ELIMINATED BY**

JALLOY
The Tank Armor Steel

Maintenance on the coal hoist above was a constant problem because of repeated failure of the links and pins on the bucket conveyor. All pins and links were replaced with new ones made of Jalloy, the special J&L steel made

for tough jobs involving heavy impacts and dynamic stresses. Since then down-time because of pin and link failures has been eliminated—costly maintenance work has been avoided. Write for information about Jalloy steel.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PENNSYLVANIA

THE IRON AGE, August 1, 1946—123

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points, in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. (1) Mill run sheet, 10¢ per 100 lb under base; primes, 25¢ above base. (2) Unassorted commercial coating. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. Discount of 25¢ per 100 lb to fabricators. (8) Also shafting. For quantities of 20,000 lb to 39,999 lb. (9) Carload lot in manufacturing trade. (10) Prices do not apply if rail and water is not used. (11) Boxed. (12) This base price for annealed, bright finish wires, commercial spring wire. (13) Produced to dimensional tolerances in AISI Manual Sect. 6. (14) Billets only. (15) 9/32 in. to 47/64 in., 0.15¢ per lb higher.

Basing Points													DELIVERED TO		
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	Gulf Ports, Cars	10 Pacific Ports, Cars	Detroit	New York	Phila- delphia
INGOTS															
Carbon, re-rolling	(\$33.00 f. o. b. mill)														
Carbon, forging	\$38	\$38	\$38	\$38	\$38	\$38	\$38								
Alloy.....	\$48.69	\$48.69				\$43.69									
	(Bethlehem, Massillon, Canton, Coatesville=\$43.69)														
BILLETS, BLOOMS, SLABS															
Carbon, re-rolling	\$39	\$39	\$39	\$39	\$39	(Provo=\$50.20, Duluth=\$41 ¹⁴) \$39	\$39	\$39				\$51 ¹⁴	\$41		
Carbon, forging billets.....	\$47	\$47	\$47	\$47	\$47	(Provo=\$53.20, Duluth=\$49 ¹⁴) \$47	\$47					\$59 ¹⁴	\$49		
Alloy	\$58.43	\$58.43				\$58.43							\$60.43		
	(Bethlehem, Massillon, Canton=\$58.43)														
SHEET BARS	\$38	\$38		\$38		\$38	\$38	\$38							
	(Canton=\$38)														
PIPE SKELP	2.05¢	2.05¢					2.05¢	2.05¢							
	(Coatesville=2.05¢)														
WIRE RODS ¹⁵															
No. 5 to 3/2 in.	2.30¢	2.30¢		2.30¢	2.30¢							2.55¢	2.80¢		
	(Worcester=2.40¢)														
SHEETS															
Hot-rolled	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.525¢	2.425¢		2.975¢	2.525¢	2.635¢	2.615¢
Cold-rolled ¹	3.275¢	3.275¢	3.275¢	3.275¢		3.275¢	3.275¢		3.375¢	3.275¢		3.925¢	3.375¢	3.615¢	3.635¢
Galvanized (24 gage)	4.05¢	4.05¢	4.05¢		4.05¢	4.05¢	4.05¢	4.05¢	4.15¢	4.05¢		4.60¢		4.31¢	4.24¢
Enameling (20 gage)	3.80¢	3.80¢	3.80¢	3.80¢			3.80¢		3.90¢	3.80¢		4.45¢	3.90¢	4.20¢	4.16¢
Enameling (10 Gage)	3.20¢	3.20¢	3.20¢	3.20¢			3.20¢		3.30¢	3.20¢		3.85¢	3.30¢	3.60¢	3.56¢
Long ternes ²	4.05¢	4.05¢	4.05¢									4.80¢		4.45¢	4.41¢
STRIP															
Hot-rolled ³ 6 in. and under over 6 in.	2.45¢ 2.35¢	2.45¢ 2.35¢	2.45¢ 2.35¢	2.45¢ 2.35¢	2.45¢ 2.35¢		2.45¢ 2.35¢			2.45¢ 2.35¢		3.10¢ 3.00¢	2.55¢ 2.45¢	2.85¢ 2.75¢	2.81¢ 2.71¢
Cold-rolled ⁴	3.05¢	3.15¢		3.05¢			3.05¢						3.15¢	3.45¢	3.41¢
	(Worcester=3.25¢)														
Cooperage stock	2.55¢	2.55¢			2.55¢		2.55¢							2.95¢	
TINPLATE															
Standard cokes, base box	\$5.00	\$5.00	\$5.00		\$5.10			\$5.10	\$5.10					\$5.375	\$5.301
Electro, box (0.25 lb 0.50 lb 0.75 lb)	\$4.35 \$4.50 \$4.65	\$4.35 \$4.50 \$4.65	\$4.35 \$4.50 \$4.65					\$4.35 \$4.60 \$4.75	\$4.60 \$4.75						
BLACKPLATE															
29 gage ⁵	3.30¢	3.30¢	3.30¢					3.40¢	3.40¢					3.66¢	3.59¢
TERNES, MFG.															
Special coated, base box	\$4.55	\$4.55	\$4.55					\$4.65	\$4.65						
BAR															
Carbon steel	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢		(Duluth=2.60¢) (Provo, Utah=3.20¢)		2.85¢	3.15¢	2.60¢	2.84¢	2.96¢
Rail steel ⁶	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢					2.85¢	3.15¢			
Reinforcing (billet) ⁷	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢			2.70¢	2.75¢	2.45¢	2.61¢	2.69¢
Reinforcing (rail) ⁷	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢				2.70¢	2.75¢	2.45¢		
Cold-finished ⁸	3.10¢	3.10¢	3.10¢	3.10¢		3.10¢								3.44¢	3.48¢
	(Detroit=3.15¢) (Toledo=3.25¢)														
Alloy, hot-rolled	2.92¢	2.92¢				2.92¢	2.92¢							3.02¢	
	(Bethlehem, Massillon, Canton=2.92¢)														
Alloy, cold-drawn	3.62¢	3.62¢	3.62¢	3.62¢		3.62¢								3.73¢	
PLATE															
Carbon steel ¹³	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢		2.50¢		(Coatesville and Claymont=2.50¢, Provo, Utah=3.20¢) 2.50¢		2.85¢	3.05¢	2.72¢	2.71¢	2.558¢
Floor plates	3.75¢	3.75¢									4.10¢	4.40¢		4.15¢	4.15¢
Alloy	3.79¢	3.79¢									4.27¢	4.49¢		4.01¢	3.895¢
	(Coatesville=3.79¢)														
SHAPES															
Structural	2.35¢	2.35¢	2.35¢		2.35¢	2.35¢					2.60¢	3.00¢		2.54¢	2.43¢
	(Bethlehem=2.35¢)														
SPRING STEEL, C-R															
0.26 to 0.50 carbon	2.80¢			2.80¢					(Worcester=3.20¢)						
0.51 to 0.75 carbon	4.30¢			4.30¢					(Worcester=4.50¢)						
0.76 to 1.00 carbon	6.15¢			6.15¢					(Worcester=6.35¢)						
1.01 to 1.25 carbon	8.35¢			8.35¢					(Worcester=8.55¢)						
WIRE ⁹															
Bright ¹²	3.05¢	3.05¢		3.05¢	3.05¢				(Worcester=3.15¢) (Duluth=3.10¢)		3.55¢		3.44¢	3.41¢	
Galvanized									Add proper size extra and galvanizing extra to Bright Wire Base						
Spring (high carbon)	4.00¢	4.00¢		4.00¢					(Worcester=4.10¢) (Trenton=4.25¢)		4.50¢		4.39¢	4.339¢	
PILING															
Steel sheet	2.65¢	2.65¢				2.65¢						3.20¢		2.99¢	3.01¢

PRICES

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

BASING POINT	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation	Subject to negotiation	Subject to negotiation	Subject to negotiation	Subject to negotiation	Subject to negotiation
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	22.99	24.67	17.01	17.47	20.69	25.29
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	22.99	24.67	17.01	17.47	20.69	25.29
Billets, P'gh, Chi, Canton, Newark, N. J., Watervliet, Syracuse, Balt.	Subject to negotiation	Subject to negotiation	Subject to negotiation	Subject to negotiation	Subject to negotiation	Subject to negotiation
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Watervliet, Syracuse, Newark, N. J., Ft. Wayne, Titusville.	22.99	24.67	17.01	17.47	20.69	25.29
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville.	27.05	25.97	20.02	20.56	24.34	29.75
Bars, c-i, P'gh, Chi, Cleve, Canton, Dunkirk, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet.	27.05	25.97	20.02	20.56	24.34	29.75
Plates, P'gh, Middletown, Canton	31.38	29.21	23.28	23.80	28.67	33.00
Shapes, structural, P'gh, Chi	27.05	25.97	20.02	20.56	24.34	29.75
Sheets, P'gh, Chi, Middletown, Canton, Balt.	38.95	36.79	28.67	31.38	35.16	38.49
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown.	25.43	23.28	18.39	18.93	25.97	37.87
Strip, c-r, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown.	32.46	30.30	23.80	24.34	34.62	56.26
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila.	27.05	25.97	20.02	20.56	24.34	29.75
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton.	32.46	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Newark, N. J., Syracuse.	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton, (4 in. to 6 in.)	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, O.)

An increase of 8.2 pct applies to base price and extras

	Base per lb
High speed	67¢
Straight molybdenum	54¢
Tungsten-molybdenum	57½¢
High-carbon-chromium*	43¢
Oil hardening*	24¢
Special carbon*	22¢
Extra carbon*	18¢
Regular carbon*	14¢

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi 3¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	per lb
Field grade	3.90¢
Armature	4.25¢
Electrical	4.75¢
Motor	5.425¢
Dynamo	6.125¢
Transformer 72	6.625¢
Transformer 65	7.625¢
Transformer 58	8.125¢
Transformer 52	8.925¢

F.o.b. Chicago and Gary, field grade through motor; F.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo. Pacific ports add 75¢ per 100 lb on all grades.

SHELL STEEL

per gross ton

3 in. to 12 in.	\$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00

Basic openhearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.

Prices delivered Detroit are \$2.00 higher; East Michigan, \$3 higher.

Price Exceptions: Follansbee Steel Corp. permitted to sell at \$13.00 per gross ton, f.o.b. Toronto, Ohio, above base price of \$52.00.

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Pa.	21.00*	22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	18.72	....
Inconel-clad		
10 pct, f.o.b. Coatesville..	26.00	....
Monel-clad		
10 pct, f.o.b. Coatesville..	24.96	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	9.00	....

*Includes annealing and pickling.

WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Basing Points	Coast Basing Points†
Standard wire nails	\$3.75	\$4.25
Coated nails	3.75	4.25
Cut nails, carloads	4.85	....

	base per 100 lb
Annealed fence wire	\$3.50
Annealed galv. fence wire	3.85

	base column
Woven wire fence*	72
Fence posts, carloads..	74
Single loop bale ties††	72
Galvanized barbed wire**	79
Twisted barless wire..	79

*15½ gage and heavier. **On 80-rod spools in carload quantities.

†Prices subject to switching or transportation charges.

††Add 50c a ton.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.....	\$8.50	\$17.00
15-lb coating I.C.....	9.50	19.00
30-lb coating I.C.....	10.00	20.00

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb	
No. 1 O.H., net ton	\$43.39
Angle splice bars, 100 lb	2.85
(F.o.b. basing points)	
Light rails (from billets)	\$49.18
Light rails (from rail steel)	49.18
base per lb	
Cut spikes	3.65¢
Screw spikes	5.55¢
Tie plate, steel	2.55¢
Tie plates, Pacific Coast	2.70¢
Track bolts	*4.75¢
Track bolts, heat treated, to rail-roads	*5.00¢
Track bolts, jobbers discount	63-5

*Plus a 12-pct increase.

Basing points, light rails, Pittsburgh, Chicago, Birmingham: cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, Oregon and Washington ports, add 25¢.

ALLOY EXTRAS

Alloy Steel	Basic Openhearth		Electric Furnace	
	Bars and Bar-strip	Billets, Blooms and Slabs	Bars and Bar-strip	Billets, Blooms and Slabs
A 2600	0.703¢	\$14.066	\$1.244	\$24.886
A 8700	0.757	15.148	1.298	25.988
NE 9400	0.811	16.230	1.352	25.050
NE 9700	0.703	14.066	1.244	24.886
NE 9800	1.407	28.132	1.947	38.952
NE 9900	1.298	25.968	1.677	33.542

The extras shown are in addition to the base price of \$2.92 per 100 lb on finished products and \$58.43 per gross ton on semifinished steel, major basing points, as shown in table, opposite page, and are in cents per pound when applicable to bars and bar-strip and in dollars per gross ton when applicable to billets, blooms and slabs. When acid openhearth is specified and acceptable, add to basic openhearth alloy differential 0.27¢ per lb for bars and bar-strip and \$5.41 per gross ton for billets, blooms and slabs. Alloy price increases are retroactive to Mar. 1.

PRICES

WELDED PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh district and Lorain, Ohio, mills

(F.o.b. Pittsburgh only on wrought pipe) base price—\$200.00 per net ton

Steel (butt weld)

	Black	Galv.
½-in.	60½	48
¾-in.	63½	52
1-in. to 3-in.	65½	54½

Wrought Iron (butt weld)

½-in.	17%	+4%
¾-in.	24½	2%
1-in. and 1½-in.	28%	9½
1½-in.	33	11%
2-in.	32%	11%

Steel (lap weld)

2-in.	58	46½
2½-in. and 3-in.	61	49½
3½-in. to 6-in.	63	51½

Wrought Iron (lap weld)

2-in.	24%	4%
2½-in. to 3½-in.	25%	7½
4-in.	28%	11%
4½-in. to 8-in.	27	10½

Steel (butt, extra strong, plain ends)

½-in.	58½	47½
¾-in.	62½	51½
1-in. to 3-in.	64	54

Wrought Iron (same as above)

½-in.	18%	+1%
¾-in.	25%	4%
1-in. to 2-in.	33	13

Steel (lap, extra strong, plain ends)

2-in.	56	45½
2½-in. and 3-in.	60	49½
3½-in. to 6-in.	63½	53

Wrought Iron (same as above)

2-in.	28½	8%
2½-in. to 4-in.	34	16½
4½-in. to 6-in.	32%	14%

On butt weld and lap weld steel pipe jobbers are granted a discount of 5 pct. On l.c.l. shipments prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher on all butt weld.

BOILER TUBES

Seamless steel and lap weld commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft f.o.b. Pittsburgh, in carload lots

	Seamless	Lap weld,
	Cold-Drawn	Hot-Rolled
2 in. O.D. 13 B.W.G.	16.52	13.90
2½ in. O.D. 12 B.W.G.	22.21	18.70
3 in. O.D. 12 B.W.G.	24.71	20.79
3½ in. O.D. 11 B.W.G.	31.18	26.25
4 in. O.D. 10 B.W.G.	38.68	32.56

(Extras for less carload quantities)
40,000 lb or ft and over.....Base
30,000 lb or ft to 39,999 lb or ft.... 5 pct
20,000 lb or ft to 29,999 lb or ft.... 10 pct
10,000 lb or ft to 19,999 lb or ft.... 20 pct
5,000 lb or ft to 9,999 lb or ft.... 30 pct
2,000 lb or ft to 4,999 lb or ft.... 45 pct
Under 2,000 lb or ft.... 65 pct

CAST IRON WATER PIPE

Subject to retroactive adjustment for pig iron.

	Per net ton
6-in. to 24-in., del'd Chicago	\$66.33
6-in. to 24-in., del'd New York	65.60
6-in. to 24-in., Birmingham	57.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles or Seattle for all rail shipment; rail and water shipment less	80.40
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

BOLTS, NUTS, RIVETS, SET SCREWS

An increase of 12 pct applies to all listings

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

	Base discount less case lots	Percent Off List
½ in. & smaller x 6 in. & shorter....	65½	
9/16 & 5/8 in. x 6 in. & shorter....	63½	
¾ to 1 in. x 6 in. & shorter....	61	
1½ in. and larger, all lengths....	59	
All diameters over 6 in. long....	59	
Lag. all sizes	62	
Plow bolts	65	

Nuts, Cold Punched or Hot Pressed

	(Hexagon or Square)
½ in. and smaller	62
9/16 to 1 in. inclusive	59
1½ to 1½ in. inclusive	57
1½ in. and larger	56
On above bolts and nuts, excepting plow bolts, additional allowance of 10 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.	

Semifin. Hexagon Nuts

	U.S.S.	S.A.E.
Base discount less keg lots		
7/16 in. and smaller	64	
½ in. and smaller	62	
¾ in. through 1 in.	60	
9/16 in. through 1 in.	59	
1½ in. through 1½ in.	57	
1½ in. and larger	56	
In full keg lots, 10 pct additional discount.		

Stove Bolts

	Consumer
Packages, nuts loose	71 and 10
In packages	71
In bulk	80
On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.	

Large Rivets

	(½ in. and larger)	Base per 100 Lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham		\$3.75

Small Rivets

	(7/16 in. and smaller)	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham		65 and 5

Cap and Set Screws

	Percent Off List	Consumer
Upset full fin, hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	64	
Upset set screws, cup and oval points 71		
Milled studs	46	
Flat head cap screws, listed sizes	36	
Fillister head cap, listed sizes	51	
Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.		

FLUORSPAR

Maximum price f.o.b. consumer's plant, \$30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

	Base price per short ton
Effective CaF ₂ Content:	
70% or more	\$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	30.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	\$5.45
Old range, non-bessemer	5.30
Mesaba, bessemer	5.20
Mesaba, non-bessemer	5.05
High phosphorus	5.05
Prices are for ore shipped on and after June 24, 1946, and for ore covered by adjustable pricing agreements authorized by Order No. 8, RMPR 113.	
These prices do not reflect the recent ICC increase in freight rates.	

METAL POWDERS

Prices are based on current market prices of ingots plus a fixed figure, F.o.b. shipping point, cents per lb, ton lots.
Brass, minus 100 mesh ... 18.5¢ to 20.25¢
Copper, electrolytic, 150 and 200 mesh ... 21½¢ to 23½¢
Copper, reduced, 150 and 200 mesh ... 20½¢ to 25½¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe ... 11¢ to 16¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots ... 4¢
Iron, hydrogen reduced, 300 mesh and finer, 98½ + % Fe, drum lots ... 63¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe ... 27¢ to 42¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe ... 31¢
Iron carbonyl, 300 mesh and finer, 98-99.3 + % Fe ... 90¢
Aluminum, 100 and 200 mesh ... 25¢
Antimony, 100 mesh ... 30¢
Cadmium, 100 mesh ... \$1.40
Chromium, 100 mesh and finer ... \$1.25
Lead, 100, 200 & 300 mesh ... 11½¢ to 15¢
Manganese, minus 325 mesh and coarser ... 44¢ to 61¢
Nickel, 150 mesh ... 51½¢
Silicon, minus 325 mesh and coarser ... 26¢ to 55¢
Solder powder, 100 mesh ... 8½¢ plus metal
Tin, 100 mesh ... 58½¢
Tungsten metal powder, 98%-99%, any quantity, per lb ... \$2.60
Molybdenum powder, 99%, in 200-lb kegs, f.o.b. York, Pa., per lb ... \$2.60
Under 100 lb ... \$3.00

*Freight allowed east of Mississippi.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	\$8.75
Connellsville, Pa., hand drawn ...	9.35
Foundry, beehive (f.o.b. oven)	
Fayette Co., W. Va.	8.95
Connellsville, Pa.	9.35
Foundry, Byproduct	
Chicago, del'd	15.10
Chicago, f.o.b.	14.35
New England, del'd	16.04
Kearny, N. J., f.o.b.	14.40
Philadelphia, del'd	14.63
Buffalo, del'd	14.75
Portsmouth, Ohio, f.o.b.	12.85
Painesville, Ohio, f.o.b.	13.50
Erie, del'd	14.50
Cleveland, del'd	14.55
Cincinnati, del'd	14.60
St. Louis, del'd	15.10†
Birmingham, del'd	12.25

†Except producers situated in states other than Missouri, Alabama or Tennessee, sellers may charge a maximum delivered price of \$15.60 in the St. Louis Mo., and East St. Louis, Ill., switching districts.

REFRACTORIES

(F.o.b. Works)

	Per 1000
Super-duty brick, St. Louis ...	\$76.05
First quality, Pa., Md., Ky., Mo., Ill., Ohio ...	60.40
First quality, New Jersey ...	65.90
Sec. quality, Pa., Md., Ky., Mo., Ill.	54.80
Sec. quality, New Jersey ...	57.70
Sec. quality, Ohio ...	52.95
Ground fire clay, net ton, bulk ...	8.95

	Per Net Ton
Silica Brick	
Pennsylvania and Birmingham ...	\$60.40
Chicago District ...	69.30
Silica cement, net ton (Eastern) ...	10.60

	Per Net Ton
Chrome Brick	
Standard chemically bonded, Balt., Plymouth Meeting, Chester ...	\$54.00

	Per Net Ton
Magnesite Brick	
Standard, Balt. and Chester ...	\$76.00
Chemically bonded, Baltimore ...	65.00

	Per Net Ton
Grain Magnesite	
Domestic, f.o.b. Balt. and Chester in sacks (carloads) ...	\$43.45
Domestic, f.o.b. Chewelah, Wash., in bulk ...	22.00
In sacks ...	26.00
Clinker (dead burned) dolomite, per ton East, \$9.30; Midwest, add 10¢; Mo. Valley, add 20¢.	

PRICES

WAREHOUSE PRICES

Delivered metropolitan areas, per 100 lb.

Cities	SHEETS			STRIP			Plates ¾ in. and heavier	Structural Shapes	BARS		ALLOY BARS			
	Hot- Rolled (10 gage)	Cold- Rolled	Galvanized (24 gage)	Hot-Rolled		Cold- Rolled			Hot- Rolled A-8617-20	Cold- Finished	Hot- Rolled, A-8742-50 Ann.	Cold- Drawn, A-8617-20	Cold- Drawn A-8742-50 Ann.	
				6 in. and Under	Over 6 in.									
*Philadelphia.....	\$3.743	\$5.097	\$5.218a	\$4.272	\$4.172	\$5.022	\$3.855	\$3.916	\$4.072	\$4.522	\$6.016	\$7.116	\$7.372	\$8.422
New York.....	3.815	4.838 ¹	5.46	4.324	4.224	5.024	4.018	4.008	4.103	4.553	6.058	7.158	7.403	8.453
Boston.....	3.999	4.969 ³	5.674	4.456	4.356	4.965	4.162	4.162	4.294	4.594	6.212	7.312	7.444	8.494
Baltimore.....	3.619	5.077	5.344	4.252	4.152	.....	3.844	4.009	4.052	4.502	6.109	7.209	7.352	8.402
Norfolk.....	3.996	.....	5.821	4.515	4.415	.....	4.221	4.252	4.315	4.615	.....	.....	.....	.....
Chicago.....	3.475	4.425	5.581	3.95	3.85	4.90 ⁶	3.80	3.80	3.75	4.20	5.80	6.90	.....	8.00
Milwaukee.....	3.612	4.562 ¹	5.537	4.087	4.077	5.037 ⁶	3.937	3.937	3.887	4.337	6.037	7.037	7.187	8.237
Cleveland.....	3.575	4.625	5.327	3.95	3.85	4.70 ⁶	3.65	3.838	3.60	4.20	6.006	7.106	6.95	8.00
Buffalo.....	3.575	4.625	5.20	4.169	4.069	4.919 ⁶	3.88	3.65	3.60	4.20	5.80	6.90	6.95	8.00
Detroit.....	3.675	4.725	5.45	4.05	3.95	.....	3.859	3.911	3.70	4.25	6.13	7.23	7.259	8.309
Cincinnati.....	3.65	4.70 ¹	5.275	4.025	3.925	4.961	3.911	3.941	3.861	4.461	6.15	7.25	7.311	8.361
St. Louis.....	3.622	4.572 ¹	5.581	4.097	3.997	5.181 ⁶	3.947	3.947	3.897	4.481	6.181	.....	7.331	.....
Pittsburgh.....	3.575	4.625	5.20	3.95	3.85	4.70	3.65	3.65	3.60	4.20	5.80	6.90	6.95	7.95
St. Paul.....	3.797	4.747	5.635	4.272	4.172	5.352	4.122	4.122	4.072	4.811	6.202	6.302	7.352	7.402
Omaha.....	4.035	5.72	6.00	4.53	4.43	.....	4.37	4.37	4.32	4.945	.....	.....	.....	.....
Indianapolis.....	3.745	4.795	5.37	4.12	4.02	4.99	3.88	3.88	3.83	4.43	6.13	.....	7.28	.....
Birmingham.....	3.675	.....	5.20	4.05	3.95	.....	3.80	3.80	3.75	4.903	.....	.....	.....	.....
Memphis.....	4.19	4.885	5.715	4.565	4.465	.....	4.315	4.315	4.265	4.78	.....	.....	.....	.....
New Orleans.....	4.283 [*]	5.304	5.808	4.658	4.558	.....	4.408	4.408 [*]	4.358 [*]	5.079	.....	.....	.....	.....
Houston.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles.....	4.85	6.60 ¹	6.55	5.30	5.20	.....	4.80	4.70	4.65	6.03	.....	.....	.....	.....
San Francisco.....	4.12	6.87	6.35	4.60	4.50	4.15	4.15	4.15	4.30	5.78	.....	.....	.....	.....
Seattle.....	4.87 ⁵	7.27 ²	6.40	4.60	4.50	.....	5.00 ⁵	4.70 ⁵	4.60 ⁵	6.23	.....	.....	.....	.....
Portland.....	4.87 ⁴	6.82 ²	6.20	5.10	5.00	.....	5.00 ⁴	4.70 ⁴	4.70 ⁴	5.98	8.15	.....	9.20	.....
Salt Lake City.....	4.75	.....	6.62 ⁷	5.88	5.78	.....	5.23 ⁷	5.23 ⁷	5.13	6.35	.....	.....	.....	.....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars, 1500 lb base.

NE ALLOY BARS: 1000 to 39,999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 450 to 3749 lb; (4) 300 to 4999 lb; (5) 300 to 10,000 lb; (6) 2000 lb and over; (7) 3500 lb and over.

(*) Philadelphia: Galvanized sheet, 25 or more bundles.

Extra for size, quality, etc., apply on above quotations.

* Add 0.271¢ for sizes not rolled in Birmingham.

** City of Philadelphia only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area.

PIG IRON PRICES

Per gross ton, retroactive to May 29.

These prices do not reflect the recent ICC increase in freight rates. New prices will be published as soon as various state commissions approve the increases.

BASING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem.....	29.00	29.50	30.00	30.50	34.00	Boston.....	Everett.....	0.50	29.50	30.00	30.50	31.00	40.02
Birdsboro.....	29.00	29.50	30.00	30.50	34.00	Boston.....	Birdsboro-Steelton.....	4.02	.....	.....	.....	.....	.....
Birmingham.....	27.50	24.88 [*]	27.50	27.50	34.00	Brooklyn.....	Bethlehem.....	2.50	31.50	32.00	32.50	33.00	36.92
Buffalo.....	27.50	28.50	29.00	29.50	34.00	Brooklyn.....	Birdsboro.....	2.92	.....	.....	.....	.....	37.10
Chicago.....	28.00	28.50	28.50	29.00	34.00	Canton.....	Clev. Ygstin, Sharpvil.	1.39	29.39	29.89	29.83	30.39	37.10
Cleveland.....	28.00	28.50	28.50	29.00	34.00	Canton.....	Buffalo.....	3.19	.....	.....	.....	.....	37.10
Detroit.....	28.00	28.50	28.50	29.00	34.00	Cincinnati.....	Birmingham.....	4.06	31.56	28.94 [*]	38.40
Duluth.....	28.50	29.00	29.00	29.50	34.00	Cincinnati.....	Hamilton.....	1.11	.....	.....	29.61	.....	38.40
Erie.....	28.00	28.50	29.00	29.50	34.00	Cincinnati.....	Buffalo.....	4.40	.....	.....	.....	.....	38.40
Everett.....	29.00	29.50	30.00	30.50	34.00	Jersey City.....	Bethlehem.....	1.53	30.53	31.03	31.53	32.03	35.94
Granite City.....	29.00	28.50	28.50	29.00	34.00	Jersey City.....	Birdsboro.....	1.94	.....	.....	.....	.....	35.94
Hamilton.....	28.00	28.50	28.50	29.00	34.00	Los Angeles.....	Provo.....	4.95	30.95	31.45	.....	.....	49.41
Neville Island.....	28.00	28.50	28.50	29.00	34.00	Los Angeles.....	Buffalo.....	15.41	.....	.....	.....	.....	49.41
Provo.....	28.00	28.50	28.50	29.00	34.00	Mansfield.....	Cleveland-Toldeo.....	1.94	29.94	30.44	30.44	30.94	37.38
Sharpsville.....	28.00	28.50	28.50	29.00	34.00	Mansfield.....	Buffalo.....	3.36	.....	.....	.....	.....	37.38
Sparrows Point.....	29.00	29.50	.....	.....	34.00	Philadelphia.....	Swedeland.....	0.84	29.84	30.34	30.84	31.34	35.24
Steelton.....	29.00	29.50	.....	.....	34.00	Philadelphia.....	Birdsboro.....	1.24	.....	.....	.....	.....	35.24
Swedeland.....	29.00	29.50	30.00	30.50	34.00	San Francisco.....	Provo.....	4.95	29.84	30.34	30.84	31.34	35.24
Toledo.....	28.00	28.50	28.50	29.00	34.00	San Francisco.....	Buffalo.....	15.41	.....	.....	.....	.....	49.41
Youngstown.....	28.00	28.50	28.50	29.00	34.00	Seattle.....	Provo.....	4.95	30.95	31.45	.....	.....	49.41
						Seattle.....	Buffalo.....	15.41	.....	.....	.....	.....	49.41
						St. Louis.....	Granite City.....	0.50	30.50	29.00	29.00	29.50	41.07
						St. Louis.....	Buffalo.....	7.07	.....	.....	.....	.....	41.07

* Republic Steel Co. has been granted a \$4 increase on Basic and Foundry pig iron produced at Birmingham.

(1) Struthers Iron & Steel Co., Struthers, Ohio, may charge 50¢ per ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Charcoal pig iron base prices for Lyles, Tenn., and Lake Superior furnaces, \$38.00 and \$34.00, respectively. Newberry Brand of Lake Superior charcoal iron \$39.00 per g.t., f.o.b. furnace. Delivered to Chicago, \$42.34.

High phosphorus iron sells at Lyles, Tenn., at \$28.50.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each

0.50 pct manganese content in excess of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron, silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—\$34.00; f.o.b. Buffalo—\$35.25. Add \$1.00 per ton for each additional 0.50 pct Si. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for prices of comparable analysis.

FERROALLOY PRICES

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.
 Carload lots (bulk) \$135.00
 Less ton lots (packed) 148.50
 F.o.b. Pittsburgh 139.50
 \$1.70 for each 1% above 82% Mn; penalty, \$1.70 for each 1% below 78%.
 Briquets—cents per pound of briquet, freight allowed, 66% contained Mn.
 Eastern Central Western
 Carload, bulk .. 6.05 6.30 6.60
 Ton lots 6.65 7.55 8.55
 Less ton lots ... 6.80 7.80 8.80

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.
 16-19% Mn 19-21% Mn
 3% max. Si 3% max. Si
 Carloads \$35.00 \$36.00
 Less ton lots 47.50 48.50
 F.o.b. Pittsburgh, Chicago 40.00

Manganese Metal

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.
 96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.
 Carload, bulk 30
 L.c.l. lots 32

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.
 Carloads 32
 Ton lots 34
 Less ton lots 36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.
 Carloads Ton Less
 0.10% max. C, 0.06% P, 90% Mn 21.00 21.40 21.65
 0.10% max. C 20.50 20.90 21.15
 0.15% max. C 20.00 20.40 20.65
 0.30% max. C 19.50 19.90 20.15
 0.50% max. C 19.00 19.40 19.65
 0.75% max. C 18.50 18.90 19.15
 7.00% max. Si 16.00 16.40 16.65

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed. 65-70% Mn, 17-20% Si, 1.5% max. C.
 Carload, bulk 6.05
 Ton lots 6.70
 Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet. 5.80
 Ton lots 6.30
 Less ton lots 6.55

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, \$51.25 f.o.b. Keokuk, Iowa; \$48.00 f.o.b. Jackson, Ohio; \$49.25 f.o.b. Niagara Falls. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 per ton for low impurities, not to exceed: P—0.05%, S—0.04%, C—1.00%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots, packed.
 Eastern Central Western
 96% Si, 2% Fe.. 13.10 13.55 16.50
 97% Si, 1% Fe.. 13.45 13.90 16.80

Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si.
 Eastern Central Western
 Carload, bulk .. 3.60 3.75 3.90
 Ton lots 4.05 4.55 4.60
 Less ton lots .. 4.45 4.80 4.85

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.
 Eastern Central Western
 50% Si 7.05 7.50 7.65
 75% Si 8.55 8.70 9.25
 80-90% Si 9.50 9.65 10.15
 90-95% Si 11.80 11.95 12.40

Ferrochrome

(65-72% Cr, 2% max. Si)
 Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.
 Eastern Central Western
 0.06% C 23.00 23.40 24.00
 0.10% C 22.50 22.90 23.50
 0.15% C 22.00 22.40 23.00
 0.20% C 21.50 21.90 22.50
 0.50% C 21.00 21.40 22.00
 1.00% C 20.50 20.90 21.50
 2.00% C 19.50 19.90 20.50
 66-71% Cr, 4-10% C ... 14.50 14.90 15.00
 62-66% Cr, 5-7% C 15.05 15.45 15.55

Briquets—contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.
 Eastern Central Western
 Carload, bulk .. 9.20 9.50 9.90
 Ton lots 9.80 10.30 11.80
 Less ton lots .. 10.10 10.60 12.10

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low-carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N. High-carbon type: 66.71% Cr, 4-5% C, 0.75% N. Add 5¢ per lb to regular high-carbon ferrochrome price schedule.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.
 High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Eastern Central Western
 Carload 15.60 16.00 16.10
 Ton lots 16.65 17.30 18.50
 Less ton lots .. 17.30 17.95 19.15

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.
 Eastern Central Western
 Carload 20.00 20.40 21.00
 Ton lots 21.00 21.65 22.85
 Less ton lots .. 22.00 22.65 23.85

Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed. 97% min. Cr, 1% max. Fe.
 Eastern Central Western
 0.20% max. C .. 83.50 85.00 86.25
 0.50% max. C .. 79.50 81.00 82.25
 9.00% min. C .. 79.50 81.00 82.25

Chromium—Copper

Contract price, cents per pound of alloy, f.o.b. Niagara Falls, freight allowed east of the Mississippi. 8-11% Cr, 88-90% Cu, 1.00% max. Fe, 0.50% max. Si.
 Shot or ingot 45¢

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.
 30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.
 Eastern Central Western
 Carloads 13.00 13.50 15.55
 Ton lots 14.50 15.25 17.40
 Less ton lots .. 15.50 16.25 18.40

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.
 Eastern Central Western
 Carloads 15.50 16.00 18.05
 Ton lots 16.50 17.35 19.10
 Less ton lots .. 17.00 17.85 19.60

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1¢ for central zone; 5¢ for western zone.
 Cast Turnings Distilled
 Ton lots \$1.35 \$1.75 \$4.25
 Less ton lots.. 1.60 2.00 5.00

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.
 Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.
 Eastern Central Western
 Ton lots 12.00 12.75 14.75
 Less ton lots .. 12.50 13.25 15.25
 Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.
 Ton lots 11.75 12.50 14.50
 Less ton lots .. 12.25 13.00 15.00

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.
 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe.
 Eastern Central Western
 Ton lots 12.00 12.85 14.60
 Less ton lots .. 12.50 13.35 15.10

Other Ferroalloys

Ferrotungsten, standard, lump or ¼X down, packed, f.o.b. plant
 Niagara Falls, Washington, Pa., York, Pa., per pound contained T, 5 ton lots, freight allowed. \$1.38
 Ferrovandium, 35-55%, contract basis, f.o.b. plant, freight allowed, per pound contained V.
 Openhearth \$2.70
 Crucible \$2.80
 High speed steel (Primos) \$2.98
 Vanadium pentoxide, 88-92% V₂O₅ technical grade, contract basis, per pound contained V₂O₅ \$1.10
 Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Nb.
 Ton lots \$2.25
 Less ton lots \$2.30
 Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo 95¢
 Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo 80¢
 Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo 80¢
 Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo 80¢
 Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti \$1.23
 Less ton lots \$1.25
 Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti \$1.35
 Less ton lots \$1.40
 High-carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads \$142.50
 Ferrophosphorus, 18%, electric or blast furnaces, f.o.b. Anniston, Ala., carlots, with \$3 unitage freight equalled with Rockdale, Tenn., per gross ton \$58.50
 Ferrophosphorus, Electrolytic, 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., \$3 unitage freight equalized with Nashville, per gross ton \$75.00
 Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
 Carload lots 14¢
 Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy
 Carload, bulk 4.60¢
 Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Niagara Falls, carload 5.75¢
 Ton lots 7.25¢
 Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound Car lots 8.00¢
 Ton lots 8.75¢
 Less ton lots 9.25¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.
 Ferroboration, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.
 Eastern Central Western
 Less ton lots.. \$1.30 \$1.3075 \$1.329

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.
 Ton lots \$1.89 \$1.903 \$1.935
 Less ton lots .. 2.01 2.023 2.055

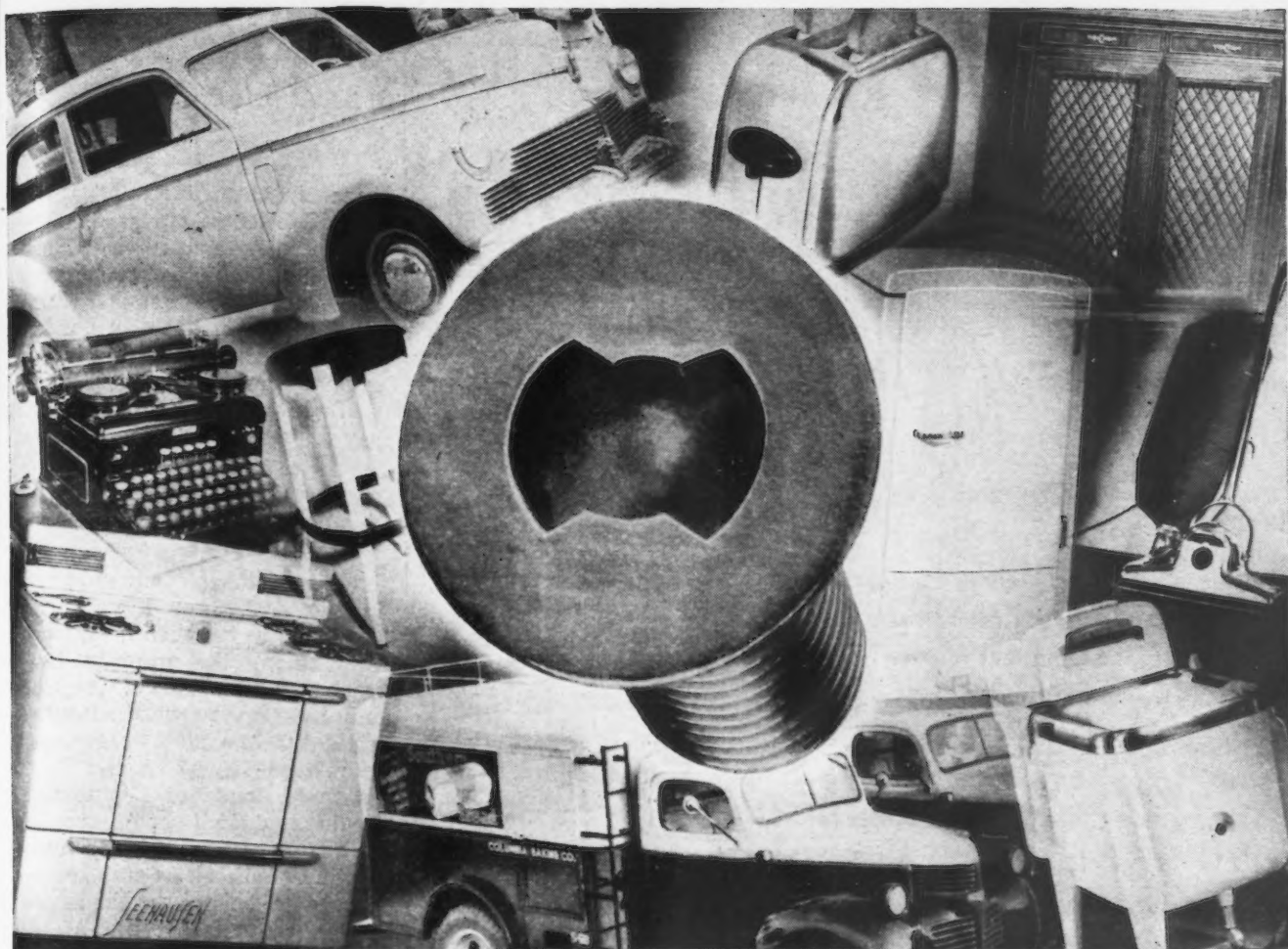
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.
 Less ton lots. \$2.10 \$2.1125 \$2.1445

Silicaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
 carload lots 25¢
 Ton lots 26¢

Silvaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
 Carload lots 58¢
 Ton lots 59¢

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.
 No. 1 87.5¢
 No. 6 60¢
 No. 79 45¢

Bortram, f.o.b. Niagara Falls
 Ton lots, per pound 45¢
 Less ton lots, per pound 50¢



TYPE "A"
ASSEMBLY BIT

COMMON
SCREWDRIVER

Whatever Your Product . . . Clutch Heads Will Streamline Your Assembly Line

Because this modern screw offers you features not matched by any other screw on the market . . . for lower-cost, safer, faster, easier driving.

Here is the evidence . . . direct from the records of CLUTCH HEAD users:

"ASSEMBLY COSTS CUT 22%"

"ZERO IN DAMAGE FROM DRIVER SLIPPAGE"

"THE TYPE 'A' BIT OUTLASTS OTHER BITS 5 TO 1"

"SCREWDRIVER OPERATION SIMPLIFIES FIELD SERVICE"

The CLUTCH HEAD recess inspires operator confidence with an easy-to-hit target.

All-square contact eliminates need for end pressure to combat "ride-out" as set up by tapered driving.

The Center Pivot column insures dead-center entry for "no-canting" drive home.

The CLUTCH HEAD Lock-On unites screw and bit as a unit for easy one-handed reaching to hard-to-get-at spots.

Compare these features. Send for samples of screws and of the Type "A" Bit

Drives Extra Thousands of Screws

What other bit offers the stamina for long uninterrupted driving, plus the economy of 60-second on-the-spot reconditioning? A simple application of the end surface to a grinding wheel restores this bit to original efficiency.



No Field Service Problem Here

What other screw disposes of servicing "headaches"? CLUTCH HEAD is basically designed for operation with any common screwdriver which need only be reasonably accurate in width. Thickness of the blade is secondary.

UNITED SCREW AND BOLT CORPORATION

CLEVELAND 2

CHICAGO 8

NEW YORK 7

KORFUND

Saves Your Building, Too



Vibration from heavy impact and reciprocating machinery can cause permanent damage to the walls and floors of your factory building.

Vibration isolated and controlled by Korfund Vibro-Isolator Units is no longer a danger to the building. Just as Vibration Control saves your machinery, so does it prevent building damage. The working force of impact machinery is not diminished, but the vibration shock is blocked by the isolators and prevented from entering the building structure.

Korfund offers you Engineered Vibration Control.



Forty years of experience in solving vibration problems can be applied to your immediate needs. Write for complete information.

Korfund-designed Vibro-Isolator Units of all materials are available. At left is shown Type LK, a steel spring isolator with adjustable resilient checks at the corners to act as stabilizers.



KORFUND
VIBRATION
CONTROL

THE KORFUND COMPANY, Inc., 48-35 32nd ST., LONG ISLAND CITY 1, NEW YORK

NEWS OF INDUSTRY

The London Economist

(CONTINUED FROM PAGE 111)

vance in the future, but they are out of order in the present. For the decision has been taken, in both countries, in due and proper constitutional form—though with as much excess of haste in London as there was excess of delay in Washington. For the responsible citizen, whatever his doubts, there cannot now be either repining or sabotage. The task now is to bend every effort to make the system thus formally inaugurated on paper work in practice.

On the probable course of events in the next 2 or 3 yr there is not likely to be much divergence of view among the prophets. British exports will continue to rise, limited only by what can be produced. The present tight control of imports will be relaxed only gradually. The gap in the balance of payments will gradually dwindle and it should not be an impossible task for the controlling authorities to keep the aggregate deficit over the next 3 yr within the total of the American and Canadian credits. It is on what happens thereafter that the paths of prophecy will diverge.

So far as can now be foreseen, the credit will have been largely or entirely used up by about the end of 1948. And the same time will probably mark the transition from the present world-wide state of trade, when the only difficulty is to produce enough to meet the demand, to the more familiar conditions in which selling is the great problem. If, at that time, there is reasonable internal stability in the United States, if dollars are not made scarce by a huge American export surplus, and if the British export drive has been so successful that British goods can hold, in the face of competition, the larger slice of the world's markets that they will have won, then all will be well.

But each of these three conditions is separately vital, and if anything goes badly wrong under any one of the three heads, the system will be subject to exactly the same strains that afflicted the revived gold standard between 1929-31. The new structure is in some respects more supple, but it will not withstand an indefinite pressure. Moreover, if the strain becomes too great and something snaps, it is all too likely,

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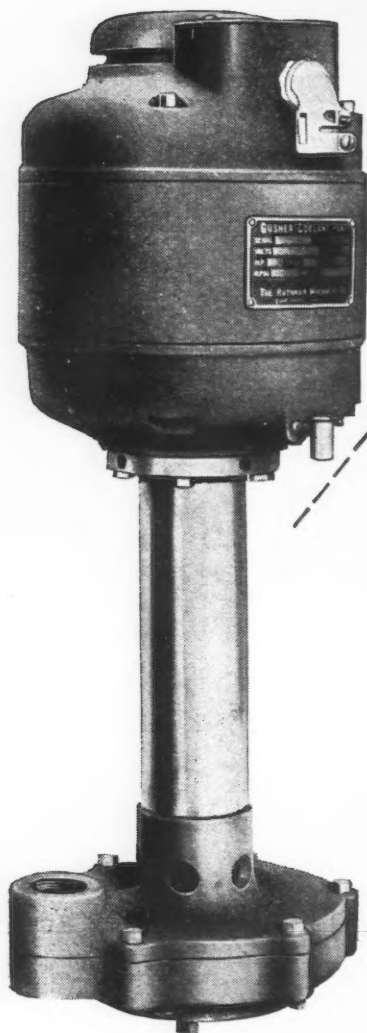
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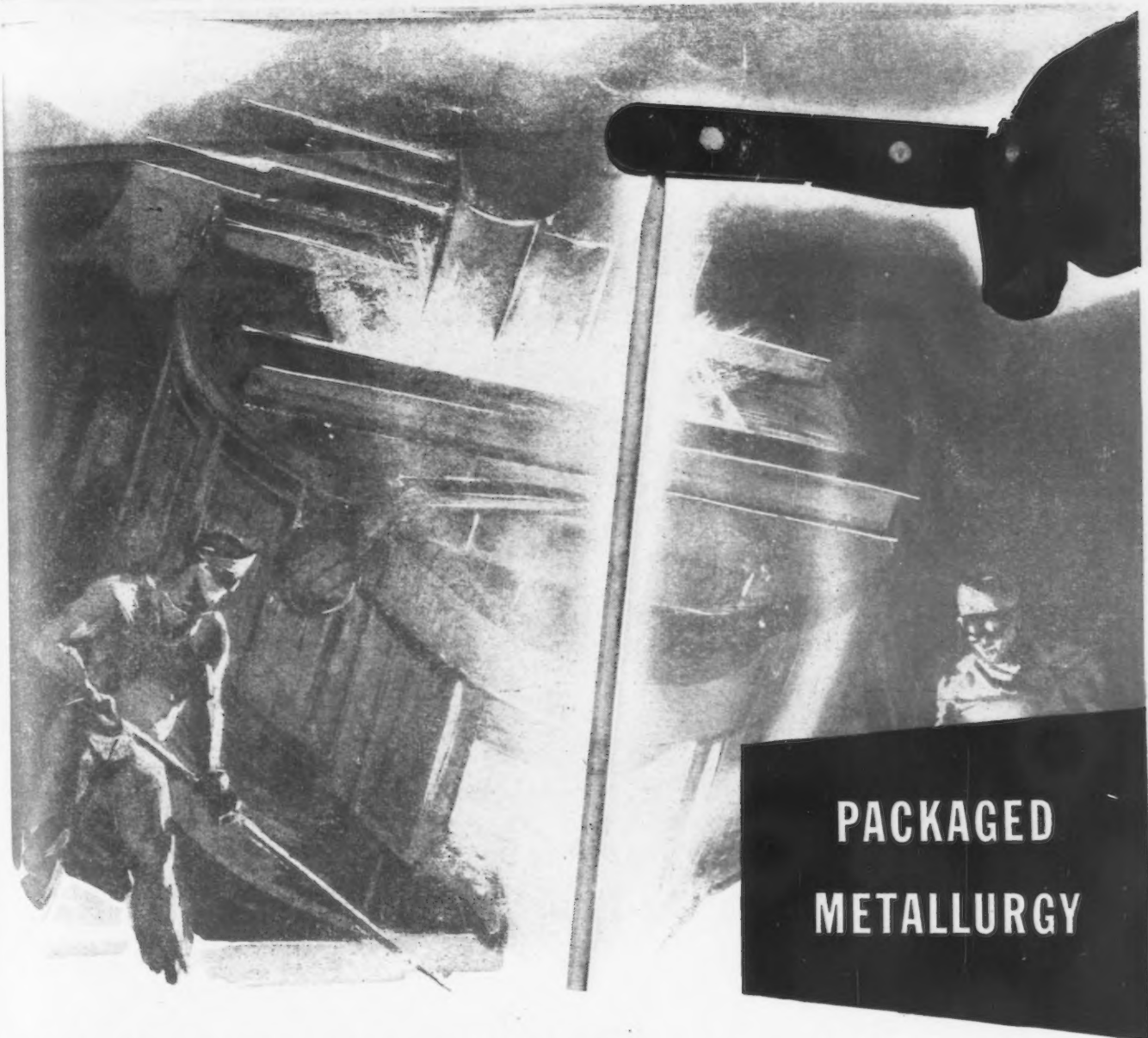
A MODERN PUMP FOR MODERN MACHINE TOOLS

given the circumstances, that it would be one of Britain's obligations or promises. The strain might originate in America, but it would not be America that would have difficulty in paying for its necessary imports or that would find itself forced to default. We cannot afford merely to believe in optimism. It is not merely a Cassandra's croaking that says things may go wrong—they did go wrong in a basically very similar attempt, undertaken under more favorable auspices, after the first war. If there is to be another testing-time, let it not be Britain that is the weakest link in the chain.

Unfortunately, the limits within which British policy can work are restricted. We can do little about American policy in respect either of maintaining full employment at home or making a plentiful supply of dollars available abroad. The agreements themselves prohibit us from putting out any sheet anchors against the possibility of renewed economic blizzards. They demand an absolute faith in the efficacy, as well as in the virtue, of nondiscrimination, and the episode of the frustrated Canadian wheat contract should disillusion those who thought that the Americans would not try to insist on a strict interpretation of the rules. The full rigor of the game will be enforced against us.

All that we can do is make our own international economic position as storm-proof as we can in the three years' grace that is given us. This is the truth behind Mr. Dalton's statement that the export drive is now all the more necessary. By 1949 or 1950 the credit will be gone, but the conditions attaching to it will remain, while repayment will begin in 1952. If, in those years, there is another economic storm, and if we have to ride it out with a strict observance of the American rules, we shall need to be considerably stronger than might otherwise be necessary. Strength, in this context, since our reserves have gone with the wind, can only mean a large export trade. Since we have promised not to try to prevent another international storm, it only remains to see that we have the largest umbrella.

This is a strange task for a Socialist Government to find itself embarking upon. For competition in the world market still has those



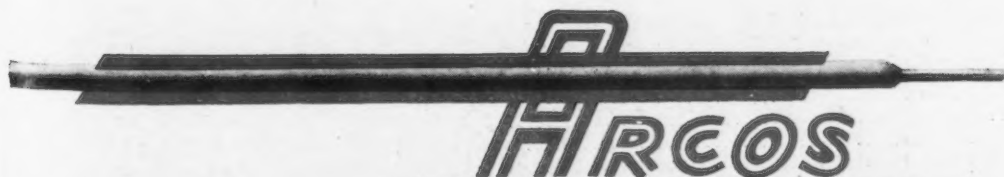
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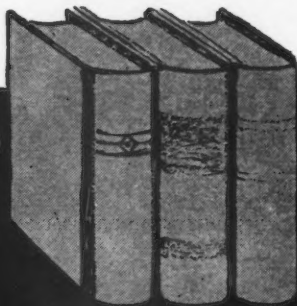
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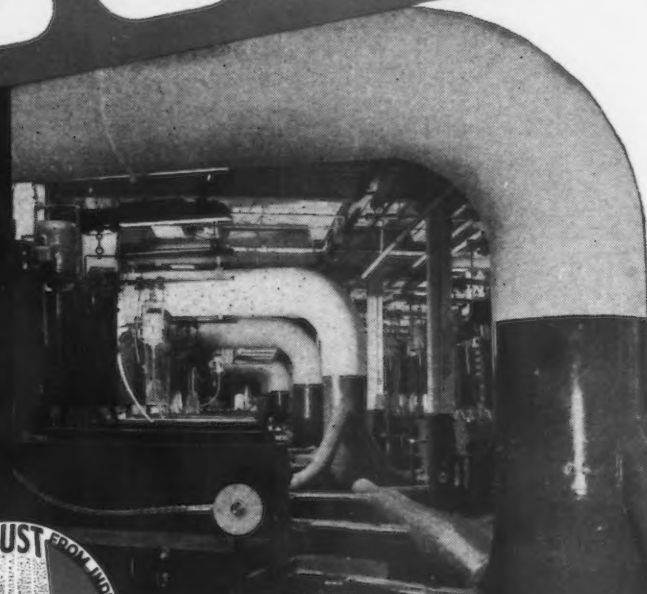
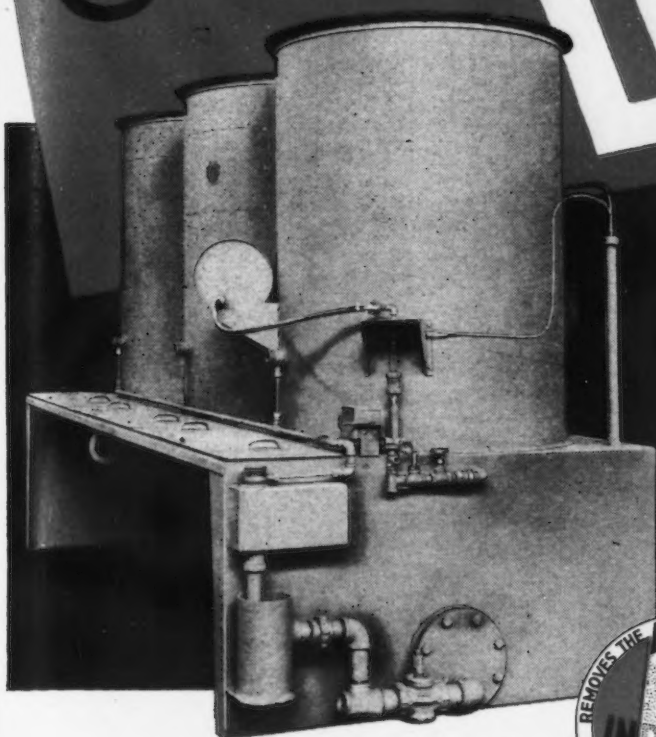
NEWS OF INDUSTRY

ugly features that Socialists strive to banish from the domestic scene. The foreign purchaser is rarely amenable to "control." The foreign competitor does not submit to "coordination." "Fixed prices" are a rare exception and "orderly marketing" still rarer. Subsidies, the last resort in the domestic field of a government that cannot otherwise make an industry's ends meet, are regarded in the foreign field as almost equivalent to a declaration of war. The foreign customer is obstinate about buying where he can buy cheapest. Price, in fact, is the very essence of exporting. Quality, of course, plays its part; but quality alone, without a competitive price, will be useless.

Wherever else the Labor Government may be able to escape from the operation of the law of supply and demand—that law of the jungle that Socialist orators are so fond of denouncing—they will have to face it in export markets. However much they may succeed, in the domestic market, in substituting the welfare of the producer for the service of the consumer as the test of economic efficiency, they cannot do so in exports. They can hope to solve the problem that the loan has set them only by adopting the principle from which trade unions shy away as the devil from holy water, the principle of cutting costs to the lowest attainable figure.

They will not find it easy to be co-ordinators at home and competitors abroad. They will need to be very stern in letting not their right hand know what their left hand doeth. Their chosen right hand is Sir Stafford Cripps; but he has not been able to prevent a little left-handedness creeping into his activities, as when, by some sort of conditioned reflex, he nationalized the Liverpool cotton market. That sort of instinct will have to be sternly repressed if the government is to perform as well in the role of Dr. Jekyll as in that of Mr. Hyde. They have just about 3 yr to prove that their economic policy can meet the brutal test of economic efficiency—that is, whether or not it can produce better goods, at lower prices, than other countries. If it can, the world will be at its feet. If it cannot, no amount of appeal to social justice, no "planning" or schemes of solid security, will save the country from a sharp reduction in its standard of living.

Eliminate DUST



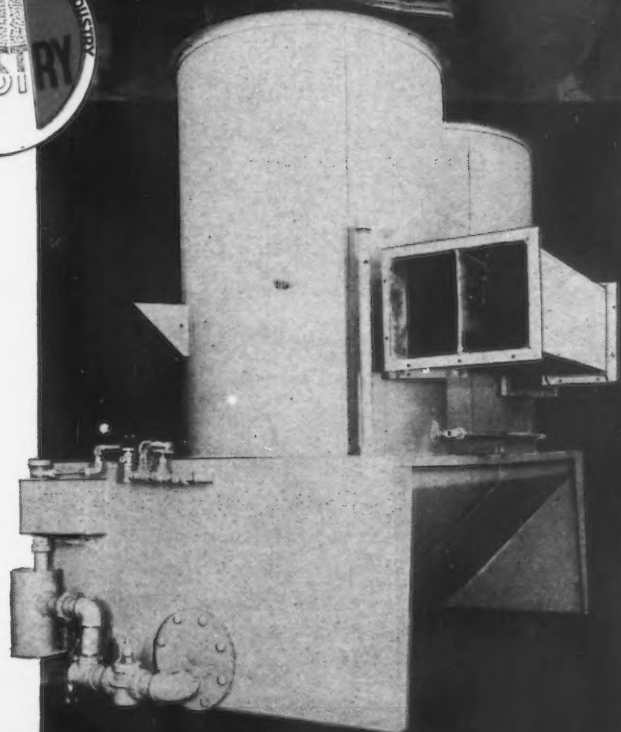
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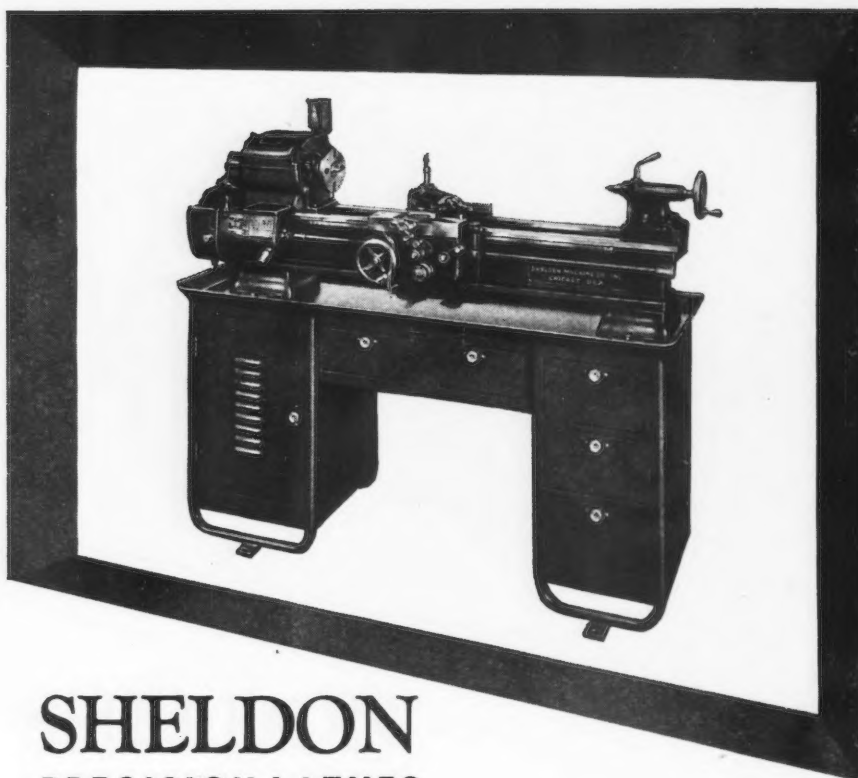
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On this page are shown batteries of two and three Mahon Hydro-Foam Dust Collectors. The illustration shows 24 grinders served by a Mahon Hydro-Foam System which handles 725,000 cubic feet of air per minute.

MAHON



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... those built in the new SHELDON machine tool plant? Always good lathes, these new SHELDONS are even better, not only in design refinements but in extreme accuracy, greater work capacity for size, "sweeter" handling and actual beauty of finish. Only a set-up like the new SHELDON plant could build such lathes—a specially designed building, the most modern manufacturing methods, complete tooling with row on row of the finest, most modern manufacturing equipment.

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The SHELDON Precision Lathe illustrated here is the "S-56", one of the famous "S-Series" of 10" Sheldon Lathes which have 1" Collet capacity, 11¼" swing, and an E-type 4-speed V-belt underneath motor drive. These extremely accurate and sturdy lathes come in bed lengths of 44, 56 or 70 inches. All are available with motor drive fully housed in a cast iron pedestal leg. The 44" and 56" models are also available mounted on heavily reinforced steel benches (as illustrated).

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NEWS OF INDUSTRY

ASM Announces New Nominees for Offices

Cleveland

... American Society for Metals has announced five nominees for the society's national officers and trustees for 1946-47. Such nominations are tantamount to election. Nominees are as follows:

President: Arthur L. Boegehold, head of the metallurgy dept., Research Laboratories Div., General Motors Corp., Detroit, incumbent vice-president of the society. He is a graduate of Cornell University and has been with General Motors since 1925, prior to which he was with Remington Arms Co. and the Bridgeport Brass Co., both of Bridgeport, Conn. He is a past chairman of the Detroit Chapter of the society and was selected to deliver the important Campbell Memorial Lecture before the ASM in 1938.



Mr. Boegehold



Mr. Eisenman

Vice-president: Francis B. Foley was graduated from Girard College and started his metallurgical career with the Midvale Co., Nicetown, Philadelphia, in 1905. Later he taught metallography at the University of Minnesota, engaged in research projects for the U. S. Bureau of Mines. In 1926 he returned to the Midvale Co. as superintendent of research. He is past chairman of the Philadelphia Chapter of ASM.



Mr. Foley

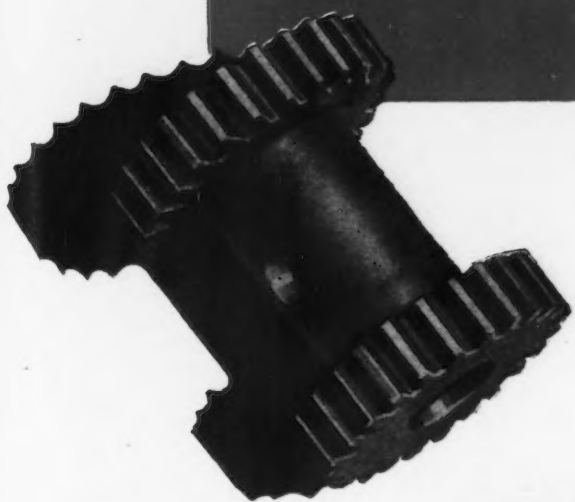
Secretary: William H. Eisenman, national secretary of ASM since its organization in 1918, was nominated for reelection for his fifteenth consecutive 2-yr term.

Trustees: Dr. John E. Dorn, as-

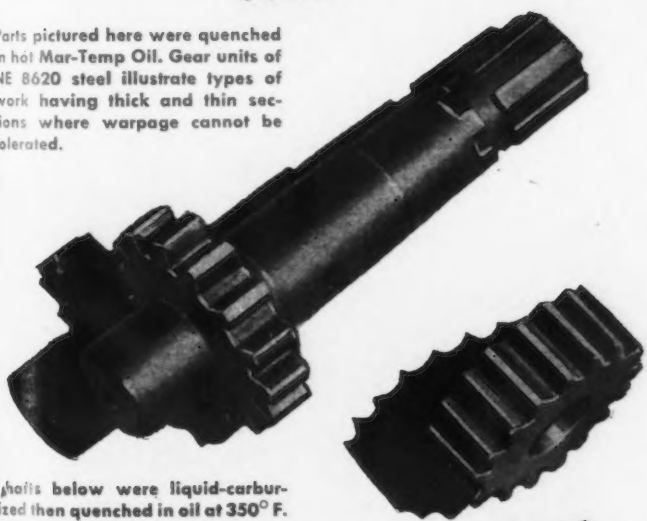
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Shafts below were liquid-carburized then quenched in oil at 350° F. This eliminated the need for careful cleaning before salt quenching, which was imperative between baths based on cyanide and nitrates.



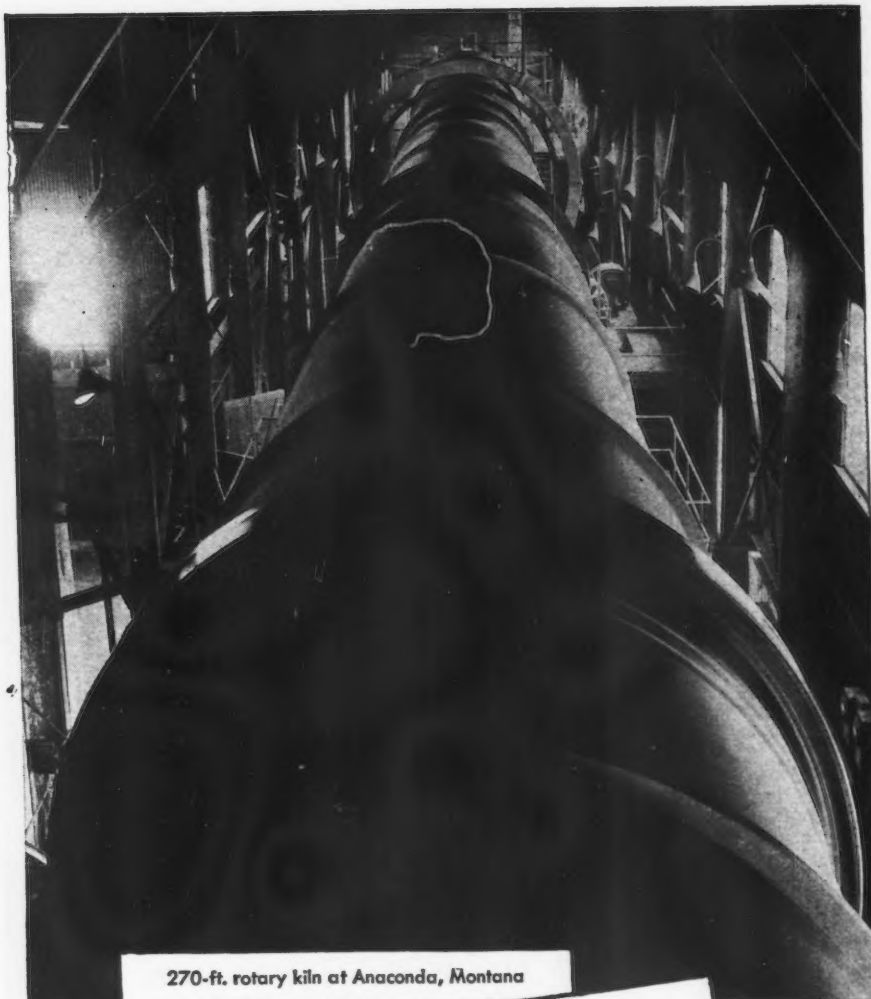
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Somewhere in your heat treat there is a place for Mar-Temp Oil. Talk it over with the Houghton Man, or write
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SiO ₂	8%
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Fe	3.1%
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NEWS OF INDUSTRY

sociate professor of physical metallurgy, University of California, and Dr. Arthur E. Focke, research metallurgist, Diamond Chain & Mfg. Co., Indianapolis, were nominated for 2-yr terms as trustees of the society. Dr. Focke is past chairman of the Indianapolis Chapter, ASM.

Formal elections and induction into office will take place at the ASM annual meeting in Atlantic City during the week of Nov. 18 as part of the National Metal Congress and Exposition.

AAF Has Difficult Job In Surplus Disposal

(CONTINUED FROM PAGE 112)

workable set of rules and guiding principles. To all intents and purposes the plea for corrective action was never answered.

Spring of 1945 saw the flood of surpluses resulting from victory in Europe, the nation clamoring for reconversion, and no one prepared to deal with the problem. The basic fault lay in the Surplus Property Act which set forth conflicting idealistic principles in weak generalities and which assigned no real responsibility to anyone. Everyone's eye was on finishing Japan; no attempt was made to provide the Surplus Property Administration and the federal disposal agencies with competent personnel, sufficient funds, and adequate facilities.

There was nothing to force the creation of an effective organization within the disposal agencies because the military services were required by law to maintain physical custody of their surpluses for an indefinite period. It was the Army and the Navy which did the work and paid the bills for packaging, transporting, and storing surplus property while having no say in the disposal of it.

As war agencies curtailed their operations, the first to be let out formed the nucleus of the disposal force. Almost invariably this represented a promotion; later on in the face of inflexible civil service regulations good men who became available took subordinate positions or, more often, went home. The turnover of what personnel there was was unbelievable, there was no continuity in office, and fresh starts

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Lockheed Aircraft Corporation is testing its "Speedpak," a streamlined metal container that fastens to the underside of an airliner and holds four tons of cargo.

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Westinghouse has patents on a new fluorescent lamp that resembles an incandescent bulb and uses arsenic in place of mercury.

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Du Pont is developing a method of porcelain enameling aluminum.

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A 2-horsepower electric motor, weighing only fifteen pounds, is made by Electrical Engineering & Manufacturing Corporation.

Myles Plastics Corporation of New York claims to have methods and compounds by which small, simple plastic parts can be molded cold at rates of 25,000 per hour or better.

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Chestnut trees, the chief source of leather tanning agents, are threatened by blight, but Monsanto chemists are working on a synthetic tan to take its place.

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The new semi-automatic machines of General Tire and Rubber Company can turn out a tire every two minutes, which is about twice the usual output.

A vacuum-draft oil burning furnace that does not require the conventional type of chimney was shown by the Norge Division of Borg-Warner Corporation at the Oil Heat Exposition.

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Cranberry Canners Inc. of Cape Cod will test a mechanical cranberry picker this fall. It is expected to increase the yield per acre and double the rate of harvesting.

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The United States Patent Office is sorting and evaluating 10 tons of Nazi patents brought here from Germany.

get ready with CONE for tomorrow

Great deposits of bauxite have been located in Oregon, conveniently near the hydroelectric plants of the Pacific Northwest, by the Oregon State Department of Geology and Mineral Resources.

Another good TURN



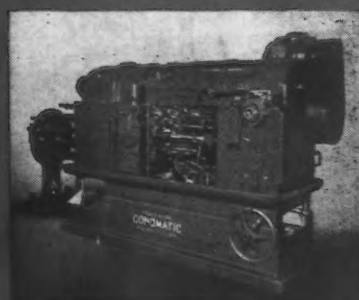
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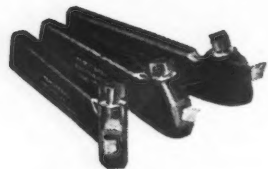


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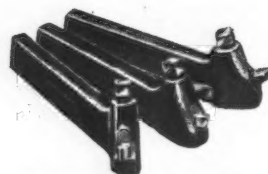


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were made on projects as often as every 90 days.

The end of the war found us with nothing to work with except huge piles of property, no policy, and no leadership sufficiently competent to evaluate the problem and take aggressive action. Congressmen harassed the disposal agencies and the military alike and yet failed to remedy the fundamental matter on which they had been forcefully forewarned. The three-man Surplus Property Board, successor to the Surplus Property Administrator, Will Clayton, appeared to lack both courage and convictions.

The Army and Navy having smashed the world's battlefronts retreated in timid silence from the nation's political and economic arena and would not discuss the situation of which they were the most acutely aware. In the past 2 yr the Treasury Dept., Dept. of Commerce, Reconstruction Finance Corp., War Assets Corp., and the War Assets Administration have been charged at one point or another with the disposal of "consumer's goods." During the same period but at different intervals there have been five changes of top surplus property administrators—a job which only one man has held for as long as 10 months.

Operating problems were even more discouraging. Practically overnight the disposal agencies had hundreds of thousands of items declared to them for resale from hundreds of different localities. The items already boxed and stored away were described in military terminology. Every man in the AAF knows what a B-4 Bag is or what a Kit, Crew Chief, Complete, consists of; but nobody else does. When it came to bits and pieces, AAF mechanics worked by stock numbers from blue prints or parts catalogs and nomenclature was usually limited to one noun. It was a physically impossible task to prepare satisfactory commercial descriptions.

The declarations of surplus property poured in on the disposal agencies by the freight carload; there were not enough clerks available to open the packages and file the reports. There was no way of consolidating the surplus inventories of the various branches of the armed forces due to differences in description and stocklisting methods. An effort was made to

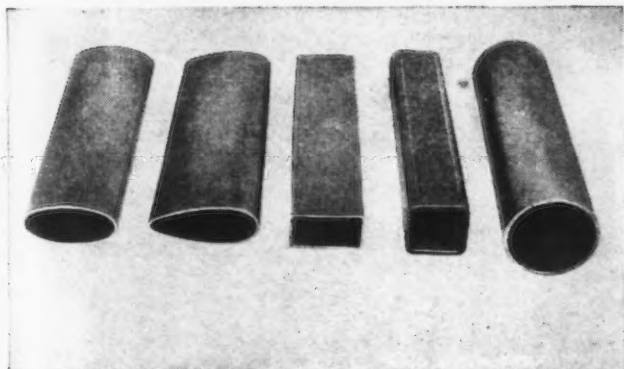
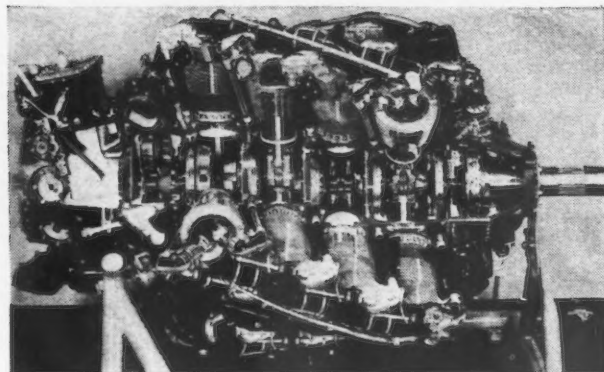
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(A) CARBURIZING GRADES

Helps Aero Engine Deliver World-Record Power

Utilizing Nickel - chromium - molybdenum triple - alloy steels wherever alloy steels are needed . . . this 3405 pound Pratt & Whitney "Wasp Major" aircraft engine delivers over 3650 horsepower. Among the highly stressed parts of triple-alloy steels are gears, piston pins and knuckle pins of 9315 and 4320 type steels. Excellent carburizing properties help make these types especially good for case-hardened parts subject to heavy duty service.



(B) MEDIUM CARBON GRADE

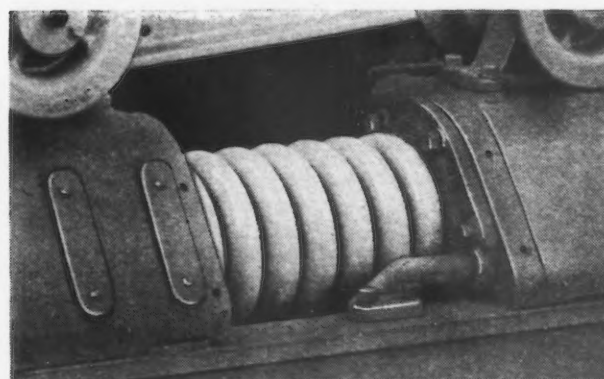
Promotes Reliability in Aircraft Tubing

Triple-alloy steel of the 8630 type is ideal for air frames and other aircraft tubing applications where a high strength/weight ratio is vital. Excellent welding and forming characteristics help assure improved response to fabricating operations. The photograph shows a few of many shapes available from Summerill Tubing Company.

(C) HIGH CARBON GRADE

Doubles Impact Resistance in Tractor Springs

Adoption of "8655" triple-alloy steel for tractor coil springs varying from $\frac{3}{4}$ " to $1\frac{3}{4}$ " in diameter, enabled Caterpillar Tractor Co. to raise impact requirements from a minimum of 10 foot pounds (Charpy double width bar) to 20 foot pounds. Exceeding this higher figure without difficulty, this triple-alloy steel provides not only high elastic strength but improved resistance to shock and fatigue failures.



These triple-alloy steels (Nickel-chromium-molybdenum) have established notable records in numerous diversified and exacting industrial applications. The large number of compositions

available permits choice of the right triple-alloy steel for a specific use.

We invite inquiries regarding the selection and uses of triple-alloy steels containing NICKEL.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 Wall Street
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BUILT FOR TOUGH JOBS!

- The invisible strength of this mighty giant lifts and places heavy loads at your command.

The rugged construction of Shepard Niles Single Beam Cranes assures added handling economy resulting in extra value in terms of production economy. Shepard Niles Cranes are made tough and durable to give long, dependable service. They are made in many types, capacities and spans to fit your particular need.



To meet competitive production schedules—to maintain smooth-flowing production lines, material handling equipment must stand up under severe operating conditions. You'll get capacity load-handling, long efficient service at low maintenance cost with a Shepard Niles Hoist.

Shepard Niles
CRANE & HOIST CORPORATION

Improve your competitive position in the industrial world. A request will bring you full data and tell you how you can put a Shepard Niles Crane to efficient use in your factory.

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find common denominators by using standard commodity codes and resulted in such ridiculous answers as bed pans and carpenter's hammers being put in the same general classification.

Mechanical tabulating equipment could not be obtained; the record keeping was done by hand. The overworked clerical force created an incredible number of errors and finally went down to complete defeat. In the summer of 1945 the major portion of the disposal agencies' inventory records were abandoned and a fresh start made.

War production was stopped but the pipelines were still full and emptied into disposal depots already overflowing with supplies no longer wanted on the battlefields or needed in the posts and camps which were rapidly being deactivated. The depots bulged at the seams.

No one would stand for storing perishable equipment in the open yet industry was alive with plans for expansion and additional storage space could not be obtained at any price. Surplus property was stacked box on box, in the order it arrived, from floor to ceiling and from wall to wall. It became a full day's job for three laborers to pull out any one box from the bulk storage.

All the handling of surplus property was done by the armed forces. Had the warehouses been attacked by termites the results would have been no more disastrous than the results of the hue and cry for demobilization. Experienced disposal men who had not been overseas were immediately sent as replacements and those who came home were discharged. The backbone of the military organization was broken.

Replacement labor could not be procured even in emergency circumstances when wage increases were authorized by special dispensation. The Army and Navy loaned men to the disposal agencies; experience was stretched so thin as to become transparent.

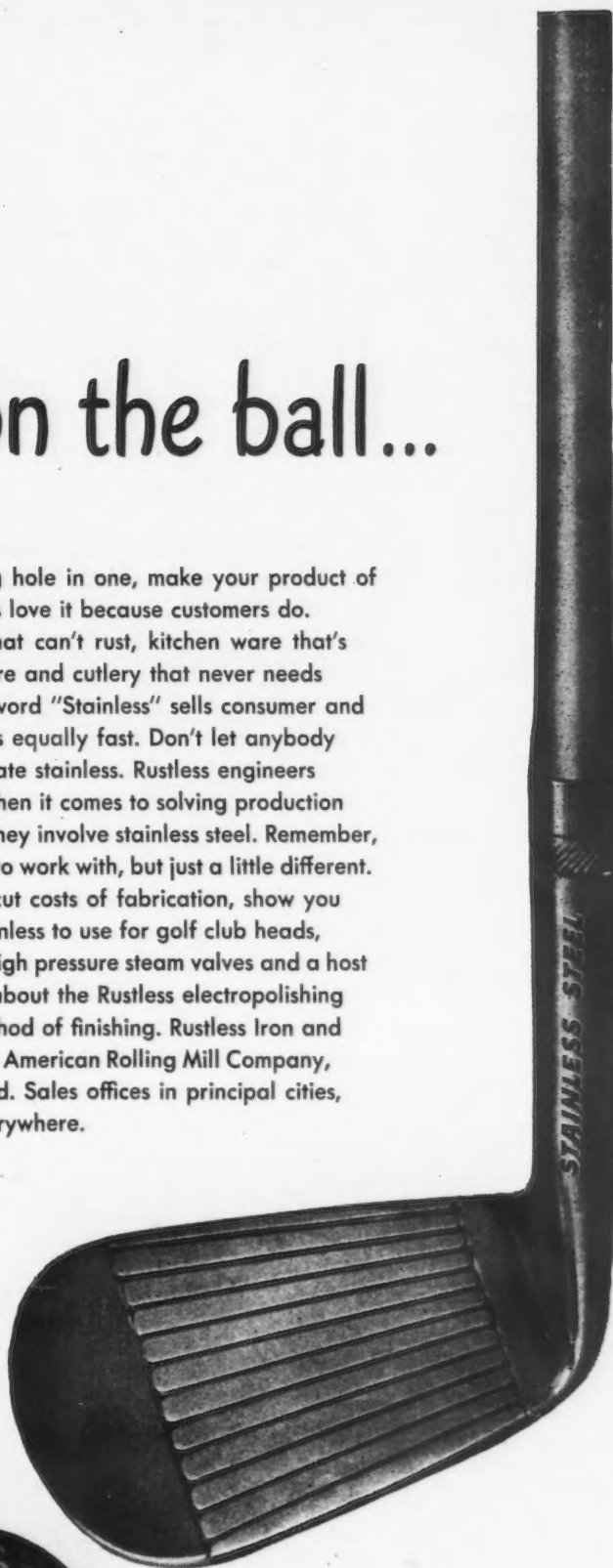
Obstacles and confusion were not limited to the action behind the scenes. There was a wide divergence of interest between various groups that posed questions which defied anything but a purely arbitrary solution. The groups were vigorous and many touchy political

Right on the ball...

For a merchandising hole in one, make your product of stainless steel. Retailers love it because customers do.

Golf club heads that can't rust, kitchen ware that's always bright, flatware and cutlery that never needs polishing—the magic word "Stainless" sells consumer and industrial products equally fast. Don't let anybody say you can't fabricate stainless. Rustless engineers are right on the ball when it comes to solving production problems whenever they involve stainless steel. Remember, stainless is not difficult to work with, but just a little different.

We can help you cut costs of fabrication, show you the best grade of stainless to use for golf club heads, potato mashers, high pressure steam valves and a host of products. Write us about the Rustless electropolishing process—a new method of finishing. Rustless Iron and Steel Division, The American Rolling Mill Company, Baltimore 13, Maryland. Sales offices in principal cities, distributors everywhere.





Guard Danger Zones in your Plant!

WHEREVER there is work to be done, men need protection from stumbles, falls and fatigue that frequently cause serious injuries. In plants where industrial trucks must move safely and speedily, flooring must be extra strong and durable. That is why so many plant managers have installed U·S·S Multigrip Floor Plate on entire floors, on aisles, walkways, ramps, step plates and other spots that have proved to be accident breeders.

In the illustration you can readily see that Multigrip is designed for safety. The arrangement of its closely-spaced risers assures positive traction and skid resistance, in every direction. These flat-topped risers are comfortable under foot, tending to reduce fatigue and increase efficiency.

Rolled of tough, durable steel, Multigrip Floor Plate protects the underfloor, strengthens it structurally, and remains safe—wet or dry—under the wear and tear of plant traffic for years on end. Easily cleaned, quickly installed, Multigrip reduces lost man-hours and vehicle repair. It increases the life of flooring, thereby decreases its cost. Write today for information or contact your local U·S·S Multigrip distributor.



POWER HOUSE FLOORS



LISTEN TO the "Hour of Mystery" presented by United States Steel on the radio every Sunday evening. Consult your local newspaper for time and station.



U·S·S MULTIGRIP FLOOR PLATE

CARNEGIE-ILLINOIS STEEL CORPORATION
Pittsburgh and Chicago

Columbia Steel Company, San Francisco, Pacific Coast Distributors
Tennessee Coal, Iron & Railroad Company, Birmingham, Southern Distributors
United States Steel Export Company, New York

UNITED STATES STEEL

issues clashed in direct conflict.

The branches of the armed forces eyed each others' surpluses rather than initiated new procurement. Federal, state, and municipal agencies clamored for a priority crack at items which were either not back on the market or not in their normal budget. The Veteran's Administration, schools, and charitable organizations advanced both intelligent as well as emotional arguments in behalf of their pleas for preferential treatment. Industry was begging for the productive equipment, raw materials, and finished goods to expedite the return to a peacetime economy.

The Smaller War Plants Corp. made a place for itself in the sun and championed the rights of little businessmen. Congressmen seized the popular issue and stumped for veteran's priority while the press bitterly reflected the general impatience of John Q. Public. Various combinations of priorities were tried resulting in delays of 2 to 5 months and howls from those who were left out. On the whole an effort was made to satisfy everyone with the invariable result that no one was happy.

The question was not simply who to sell it to but also how. The disposal agencies with no real profit and loss sheet could compete with anyone. Sales could be made direct to the consumer or in job lots to wholesalers thus avoiding the cost and organization necessary to complete thousands of insignificant transactions daily. The property could be returned to original manufacturers for inspection and distribution through normal trade channels; on the one hand preventing deteriorated material from reaching the public and on the other allowing the same company to make two profits from one item.

Agency agreements could be made on a cost plus fixed fee basis but exclusive arrangements do not meet with popular approval. Should sales be regional or national, general or to selected interested buyers? Unfortunately attention was focused on particular cases and spectacular items; no solid pattern for future sales appeared. The forest was missed and only a few trees felled causing the most dismal confusion in all quarters.

With the memory of World War



TITANIUM VITREOUS ENAMELING IRON

Recent production experience with Titanium enameling iron demonstrates... more clearly than ever before... the unique advantages of this new advance in the enameling industry.

With Titanium enameling iron—the cover coat, in white or color, is satisfactorily applied directly to the base metal. Ground coats are usually unnecessary when proper shop conditions are observed. As a result,

production is doubled, often tripled—capacity boosted—and substantial savings effected.

In addition, products can be made with thin finishes superior to chipping and breaking. Resistance to thermal shock at high temperatures is retained. Service life is extended. There is no enamel boiling and little or no sagging or warping at enameling heats. For Titanium stabilizes (or fixes) the carbon in steel. Re-

sultant carbonless iron, having no yield point, is especially satisfactory for deep drawing.

Both manufacturers of enamelware and steel find these and other features of this new Titanium enameling iron worth investigating. It's easy to get the facts. Our field engineers and research organization will welcome the opportunity to cooperate. Write today. There's no obligation, of course.

THE Merit Mark OF METAL



Pending patent applications on the new enameling process and products made thereby are owned jointly by Inland Steel Company and The Titanium Alloy Manufacturing Company under Trust Agreement.

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Executive Offices: 111 BROADWAY, NEW YORK CITY General Offices and Works: NIAGARA FALLS, N. Y.

Largest Supplier of Titanium Compounds



FORWARD DRAWINGS FOR ESTIMATE!

Dies built of **Strenes Metal** are usually available for use quicker because there is far less machining time involved—a cost economy.

Strenes Metal dies invariably deliver several times the usual number of stampings between redressings, regardless of the depth of the draw—a production advantage.

Heaviest users of **Strenes Metal** dies include car, truck, tractor, farm implement manufacturers; also stove, refrigerator, casket and vault builders.

Perhaps you should be using **Strenes Metal** dies. Send in your drawings for study and estimates.

THE
Advance Foundry Co.
100 SEMINARY AVE.
Dayton 3, Ohio



NEWS OF INDUSTRY

I scandals still fresh or recently called to mind, the original philosophy of the disposal agencies was that everything had value and that by using a cautious approach the goal of the maximum return for every dollar of surplus could easily be achieved. The defense was up and there were to be no speculative profits this time. This idea was carried to such an extreme that a declaration of surplus had to be prepared in seven copies to list a single flat washer valued at four mills.

Everything was to be studied and priced on a par with current market values. In the face of an inventory of many hundreds of thousands of items, this was fantastic. Eventually after many months of annoying insistence by a 25-yr old Air Corps officer the point was carried that a very large proportion of the surplus had no value other than as junk and also that nominal quantities should be sold by owning agencies without reference to the disposal agencies.

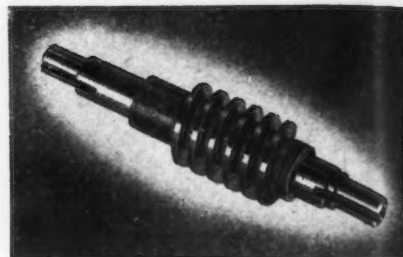
Late in 1945 items having only combat use were classified as scrap or salvage and quickly disposed of accordingly. For the first time the problem began to cut down to man size. The change in philosophy, however, did not bring escape from price problems. What differential should be applied to items in various stages of use or repair? What effect should the quantity a purchaser will take have on price? What is the value of an item for a lesser alternative use? There were endless theoretical questions.

The disposal agencies had no accurate cost data; in only a few instances could a fair comparison be made to items on the commercial market. Testing the market with pilot sales proved wholly unreliable. The confusion of aims in the minds of the men administering the disposal program alienated business men who might otherwise have offered tangible cooperation. To American industry indecision is a cardinal sin and soon the most desirable customers were driven from the market.

Assuming that all other factors were under control, there was still the extremely hypothetical question of what quantity of each item would strangle production and what quantity would stimulate re-conversion. During the war a

PRECISION PARTS

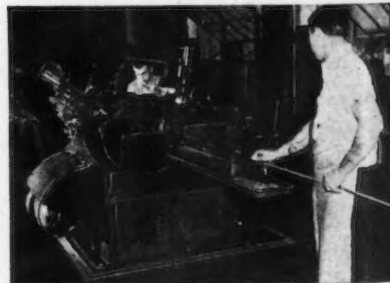
GEARED-UP FOR SPEED



As a plane takes to the air it neatly tucks its landing gears underneath its belly, speeding its flight and increasing the efficiency of its engines. The effortless, fool-proof meshing of hydraulic worm and worm gear which makes this possible demands precision of the highest order... precision that Ace is well qualified to deliver.

Producing such a worm in mass quantities is really quite simple, if you have the engineering skill and the up-to-date machines that Ace has. The piece must be machined from the blank, rough turning all the diameters and rough grinding the worm. The entire piece is then heat-treated. After heat-treating, it is returned to the thread grinder and the worm is finish ground to a tolerance of $\pm .0003$ ". The four other diameters used as bearing surfaces are cylindrical-ground concentric to the major diameter of the worm and to each other... within a total indicator reading of $\pm .0002$ ".

Worms or threads, spindles or valves... small parts and assemblies whatever their nature... are all the same to Ace. Where precision is required, we will produce it, and in production quantities. Ace has complete facilities for tool and die work, stamping, machining, heat-treating and grinding. Send us a sample, blueprint, or sketch for quotation.



Capacity open on Centerless Grinders



ACE MANUFACTURING CORPORATION
for Precision Parts

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manufacturer of small aircraft engines was asked to turn out many times his normal volume. Additional productive facilities were put into operation and soon his yearly capacity was equal to his total output for the last 10 yr. With victory, there were a substantial number of these engine surpluses—enough to supply the commercial demand for 4 to 5 yr.

It was within the power of the disposal agency to flood the market, restrict development of a new product by progressive price reduction on the old, force the manufacturer into a "share the trade" agreement, or destroy the property in spite of its civilian use. What is the ethical and economic approach?

The disposal agencies are resigned to the proposition: "You're damned if you do, and you're damned if you don't." Right or wrong action is being stepped up but 80 pct of the salable surplus remains to be sold. It can't be done overnight; we only thought it could.

May Steel Output In Canada Rises Sharply

Toronto

• • • Production of steel ingots and castings in Canada reached the highest monthly total since May 1945, amounting to 259,626 net tons or 85.9 pct of rated capacity and compares with 247,519 tons or 81.9 pct in April and with 267,643 tons in May 1945.

The month's output included 251,697 tons of ingots and 7929 tons of casting. Charges to steel furnaces in the month under review included 123,771 tons of pig iron, 70,472 tons of scrap of consumers' own make, and 84,120 tons of purchase scrap.

In the 5 months ended with May, cumulative production of steel ingots and castings amounted to 1,234,778 net tons compared with 1,338,503 tons in the same period of 1945 and 1,271,833 tons in 1944.

Following are comparative monthly production totals for steel ingots and castings in net tons for 1946:

	Steel Ingots	Steel Castings
January	236,479	8,144
February	226,737	7,620
March	240,589	8,528
April	239,463	8,056
May	251,697	7,929
Total 5 months	1,194,501	40,277

This advertisement is not, and is under no circumstances to be construed as, an offering of this Stock for sale, or an offer to buy, or as a solicitation of an offer to buy, any of such Stock. The offering is made only by the Prospectus; the Prospectus does not constitute an offer by any dealer to sell this Stock in any State to any person to whom it is unlawful for such dealer to make such offer in such State.

100,000 Shares

Dana Corporation

(formerly SPICER MANUFACTURING CORPORATION)

Cumulative Preference Stock 3³/₄% Series A

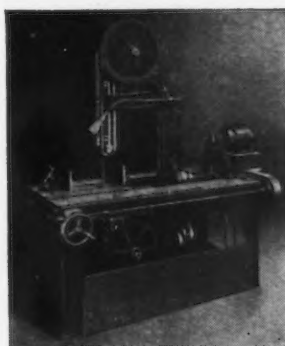
(\$100 Par Value)

Price \$102 Per Share

Copies of the Prospectus may be obtained in any State only from such dealers participating in this issue as may legally offer this Stock under the securities laws of such State.

Merrill Lynch, Pierce, Fenner & Beane

July 17, 1946



*No other
saw can
do as
much!*

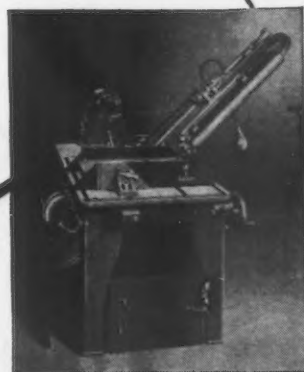
**No Other Saw
Can Do As Much!**
MARVEL Universal Band
Saw, 18" x 18" capacity, will
cut-off, trim, split, bar,
notch, pipe, structural sec-
tions, mouldings, tubing, large
standard blocks, or small ir-
regular shapes with metal can
easily and conveniently. Few
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afford to be without this most
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MARVELSAWS

Complete Range of Metal Sawing Machines

Being the largest exclusive manu-
facturer of metal sawing machines
and blades, both hack saw and
band saw type, we have the cor-
rect answer to your cut-off prob-
lems. Each MARVEL model has a
distinct application, so write us
and we will send our catalog, price
and recommendation for the saw
to fill your requirements most
efficiently. MARVEL sawing en-
gineers are also available to discuss
and analyze your cut-off work.
(Without obligation of course)

ARMSTRONG-BLUM MFG. CO.
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Greater Tonnage
Per Edge of Blade

A

**AMERICAN
SHEAR KNIFE CO.**
HOMESTEAD · PENNSYLVANIA

NEWS OF INDUSTRY

Pullman Standard Sets Record by Completing 100 Passenger Cars

Chicago

• • • **First manufacturer to complete and deliver 100 postwar streamlined cars** was the Pullman-Standard Car Mfg. Co. who rolled the hundredth car off the assembly line recently at their Chicago car works plant. Plagued by lack of materials and having constantly to reshuffle production schedules, the company is far behind in its delivery of badly needed equipment to the railroads.

Wallace N. Barker, executive vice-president of the company, said, "The adage that the first 100 are the hardest surely holds true at the Chicago plant." Resultant shortages of material caused by nationwide strikes have cut very deeply into car production. Pullman-Standard, which had expected to deliver 476 new passenger cars by July 1, has only been able to deliver 80 to the New York Central Railroad and 20 streamlined coaches to Chicago & North Western Railway. Many incomplete coaches are jamming the yards of the Chicago plant with some 150 in various stages of construction. Completion of these coaches cannot be done and will remain undelivered because of the lack of such equipment as air conditioning, electrical equipment, cushions and leg rests, interior hardware, steel conduit, rubber batteries and a host of other items. At the moment, component part shortages are holding up production to a greater extent than are the slow deliveries of flat-rolled steel, axles, wheels, and other heavy items.

Mr. Barker stated that Pullman-Standard is making every effort and is continually planning to bring production up to six cars or more a day at its Chicago plant. He added, however, that the flow of materials from the outside is in such a chaotic state that no forecast of production can definitely be made. The postwar demand of the railroads, for streamlined passenger coaches has exceeded all expectations and as of July 1, Pullman-Standard had received orders for 1445 streamlined passenger cars. With heavy pressure on by the rest of the railroad industry for fast



FROM every standpoint — materials, workmanship, operation, and economy — Kinnear Rolling Doors prove a top-notch, long-term investment. These doors, individually built by skilled craftsmen, feature a strong, flexible steel curtain of time-proved, interlocking-slat construction. With spring-counterbalanced *coiling upward action*, the doors roll quickly, easily into a small area *above the lintel*. They are rugged and durable . . . resist weather, wear, and fire. Smoothly operating, they save time and manpower. Expertly constructed, they reduce maintenance costs. Kinnear Rolling Doors may also be equipped with effort-saving Motor Operators and time-saving, conveniently located push-button control stations. For plant security and operating efficiency, first investigate, then invest in Kinnear Rolling Doors. Send for details today!

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KINNEAR
ROLLING DOORS

NEWS OF INDUSTRY

delivery of freight cars, resulting in the promises by CPA of priority certification, the outlook of increasing the production of passenger cars is not encouraging. Pullman-Standard is making an extensive effort to speed up production methods. New equipment is being installed and production lines being changed for more efficient and faster assembly.

Management Must Have Right to Manage, Says Westinghouse President

New York

• • • Overall productivity at Westinghouse plants now averages 80 to 90 pct, said Gwilym A. Price, company president, in reviewing progress since settlement of the strike on May 13. Week long strikes in the Micarta and East Pittsburgh foundry divisions early in July cut into the general average which is fully up to planned production figures in many of the company's units, he declared.

Of paramount importance in labor-management relationships today is the question of management's right to manage, he pointed out. He added that while management and labor each have definite rights they both owe to the public certain obligations which transcend and take precedence over some of the rights of either group.

Among the points settled following the recent Westinghouse strike was this right of management to handle its own affairs. Mr. Price broke down the principle into three main points: First, is the right to determine methods, materials and processes of production; the second devolves from the obligation to use properly the funds of the stockholders who provide the tools of the business.

Finally, Westinghouse felt strongly, he said, that it is entitled to administer its incentive pay system.

Under the terms of the strike settlement the operation of the incentive system remains in the hands of the management. There had been some dispute on this matter, which involves the payment to production workers of a basic wage plus a bonus based upon output.

The overall gain to Westing-

ADVENTURES OF "CRIMPY" THE BUFFALO WIRE CLOTH MAN



My life isn't my own. Everybody uses me. Serves me right for being MONEL. I can do too many things. Hard to get at times? After all, I can't be every place at once.

THEY SAY I'M "STUBBORN"



I resist so many things — non-oxidizing acids, alkalies, salts, water, food products, organic substances, high temperatures. Rust? I'm immune to it. Abrasion? I seem to wear forever.

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where product purity, flavor and clarity are essential. But that's because I'm non-contaminating. Actually I'm tough, hard and extremely strong — much more than common brass or bronze.

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BREAKDOWN OF DIFFERENTIAL

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FAIRFIELD'S production of many thousands of differentials for heavy duty trucks is just one example of the facilities available to you for production of gears, differentials, splined shafts and allied items.

Every job that comes to Fairfield is done on the very best machines for fast production and is done by highly skilled craftsmen who give the task expert attention. Well-equipped gear cutting departments

work closely with the grinding department, the automatic turning department, and the heat treating department, making production fast, smooth and sure.

Next time you need gears, remember Fairfield. Write for illustrated brochure. **FAIRFIELD MFG. CO.**
305 So. Earl Avenue
Lafayette, Indiana

FAIRFIELD *for FINE GEARS*

HANNATEN IRON INGOT

10 POUNDS



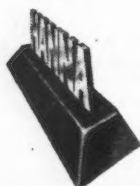
GRADES:
BASIC
SILVER
FOUNDRY
MALLEABLE
FERRO-SILICON

BRANDS:
SUSQUEHANNA
BUFFALO
DETROIT

Smaller . . . easier to handle . . . finer grain structure . . . more adaptable to the varied requirements of foundry operation. That's the new HannaTen ingot, produced in all grades of Hanna iron. Take advantage of this important development to attain more uniform distribution in the melt, to assure more accurate control of composition. It's another great Hanna "first."

The Hanna Furnace Corporation

Merchant Pig Iron Division of National Steel Corporation
BUFFALO • DETROIT • NEW YORK • PHILADELPHIA • BOSTON



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For INDUSTRIAL purposes a great variety of sizes and shapes of perforations are required, ranging from very fine to as large as 6" or more in diameter. We are equipped to supply all standard perforations in all kinds and thicknesses of metals.

ORNAMENTAL patterns are covered by our grille catalog. If interested, we hope you will send for it. There are attractive patterns for different uses.

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The
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150—THE IRON AGE, August 1, 1946

house employees following the walkout was 16.4¢, the company president declared. This compares, he stated, with the strikers' demand for 18.5¢ and a company offer of 15.5¢ made 2 months before the strike ended.

Other points written into the new contract were a change in the method of paying union stewards and an alteration in the "escape clause" in the "maintenance of membership" provision. Stewards are now paid half by the company and half by the union for their union activities on company time. Formerly the company paid the entire amount. The "escape clause" has been modified so that an employee resigning from the union no longer loses his seniority.

Mr. Price conceded that the individual needs a union, that he lacks bargaining power without it. Without in the least attempting to discredit unions as such he declared that there is today a real need for sound democratic union leadership.

Since the strike ended refrigerator production has been brought up to 1000 units a day compared to a figure of 1600 in 1940. While individual employees have generally increased their productive efficiency the usual reconversion difficulties are primarily responsible for failure to achieve the desired production rates.

Production goals, Mr. Price's listeners were told, are in almost all cases considerably above the prewar figures. Fractional horsepower motors are now being turned out at the 1940 rate and it is expected that their output will be doubled before the end of 1946.

Air Reduction Buys Plant

Washington

• • • Air Reduction Sales Co. has purchased for \$130,300 the \$176,000-acetylene plant in Portland, Ore., which it operated for the government during the war. Acetylene production will continue.

This is the eighth such government owned facility purchased by Air Reduction in recent weeks, all of which will continue in production. Locations and sales prices of the plants previously acquired are:

Rochester, N. Y., \$173,400; Emeryville, Cal., \$104,900; Flint, \$102,100; Baltimore, \$86,500; Milwaukee, \$70,800; Bettendorf, Iowa, \$59,000; and Lima, Ohio, \$49,500.

Tells of Contribution To Nazi War Machine By German Scientists

New York

• • • Evidence of the effective contribution of German scientists to the Nazi war machine is presented in a report on German scientific establishments by Col. Leslie E. Simon of the U. S. Army's Ordnance Dept. The report is now on sale by the Office of Technical Services, Dept. of Commerce.

Realizing that the enemy was superior in wealth and equipment. Hitler depended heavily on his scientists to create more and better weapons, particularly miracle weapons, according to the report. The German Army, Navy and Air Forces all had separate scientific establishments and contracted with schools, universities, and private firms to carry out specific research jobs.

The report includes descriptions of major research developments in aerodynamics, rockets, fuses, infrared, computing machines, parachutes for bomb stabilization, the use of sound as a weapon, and in many other fields. It gives a comprehensive picture of the organization of German scientific establishments, the Dept. of Commerce states.

Among the many unique contributions of German scientists to the war effort described by Col. Simon are the following:

Long-range phototheodolites which could take pictures of Dover, England, 25 km away, with such clearness that even wires on radio masts could be seen.

A nearly completed beam-climbing missile capable of following a radar beam focussed on an enemy aircraft target.

A novel instrument, 4 in. in diam and 10 in. long and filled with phosphorescent chemicals, which could be used by troops to detect infra-red waves from enemy sources.

A nearly perfected glide bomb which could be viewed on a television screen as it was guided by radio control toward its target.

A parachute attached to the tail of a jet airplane which could slow the plane sufficiently for the pilot to bail out in emergency.

Because all German research was geared to military needs, research

WASHERS

STANDARD AND SPECIAL

Every Type

Every Material

Every Purpose

Every Finish

Over 22,000 Sets of Dies

STAMPINGS

OF EVERY DESCRIPTION

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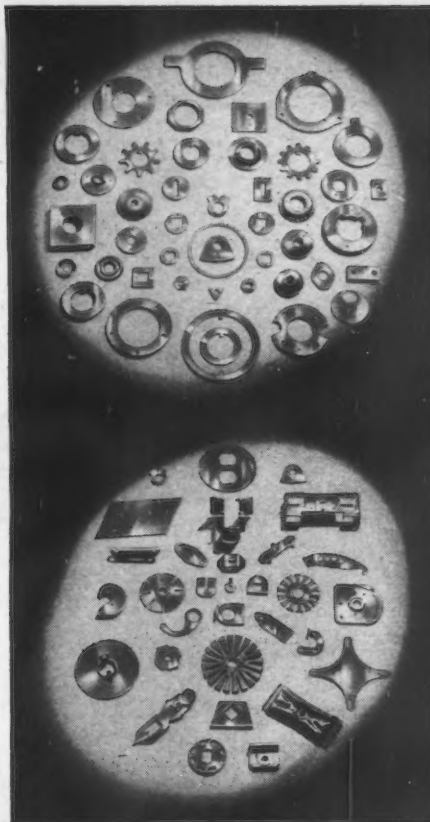
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Drawing

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Let us quote on

your requirements.



WROUGHT WASHER MFG. CO.

THE WORLD'S LARGEST PRODUCER OF WASHERS

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the establishing of one of the
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METALLOGRAPHIC DEPARTMENTS

in the commercial field in
the Middle West

operated in conjunction with our advisory and consulting
service on

- Metallurgy
- Foundry Practice

Two laboratories, Chicago and Buffalo, offer you prompt and accurate service on photomicrographs, physical testing and chemical analysis on ferrous and non-ferrous materials, sand, coal, coke, fluxes, oils, and other metallurgical materials.

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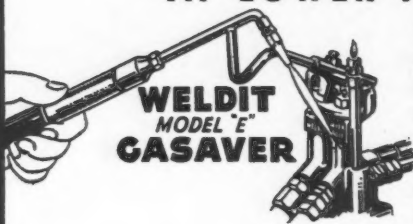
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NEWS OF INDUSTRY

agencies perforce tried to identify themselves with the war effort. At the same time, different government departments competed heavily for the services of scientific groups. This situation gave rise to confusion and to some abuses in the operation of the program.

One difficulty was the compartmentalization of research, which sometimes resulted in duplication. In one establishment, a group of scientists worked for some time on the time-travel measurement of projectiles by means of microphone pick-ups to obtain data for aircraft firing tables, without knowing that the problem had already been solved by another group in the same establishment. Rigorously enforced security regulations, resulting in the profound ignorance of one group about the activities of other groups, further complicated the problem.

Jealousy between scientists and engineers — particularly the engineers in the large corporations, such as Krupp—also handicapped progress. The engineers attempted to carry a problem through to completion. If they ran into a blind alley they consulted the scientists only on specific points, without revealing the broader phases of the problem.

Colonel Simon found German scientists not only anxious to resume their work, but convinced that the manufacture and export of arms was essential to the survival of German economy. He emphasizes the hazard of allowing military research to continue in Germany.

The report (PB-19849; photostat, \$16; microfilm, \$2.50; Sept. 1945) contains 11 main sections, each dealing with a particular establishment. Photographs, charts, and diagrams are included.

Two other reports on German wartime research also are available from OTS.

Report PB-4294 (photostat, \$15; microfilm, \$2.50; 214 pp.), prepared by investigators for the Combined Intelligence Objectives Subcommittee, contains nine sections on navigational aid systems developed at the Ferdinand Braun Institute. It also contains descriptions of 46 radar research projects undertaken at the Ernst Orlich Institute, and a summary of radar research in progress at the Ernst Lecher Institute. Brief accounts

of other research institutes are included.

PB-6672 (photostat, \$6; microfilm, \$1; 81 pp.), also prepared by CIOS investigators, describes research at 35 German universities and technical schools in supersonics, aeriels, jamming transmitters, high temperature ceramics, atomic physics, and other fields.

Orders for the reports should be addressed to the Office of Technical Services, Dept. of Commerce, Washington 25, D. C., and should be accompanied by check or money order, payable to the Treasurer of the United States.

Westinghouse to Aid Development Program Of the Army and Navy

Pittsburgh

...M. W. Smith, vice-president in charge of engineering for the Westinghouse Electric Corp., has announced the formation of a new special products engineering department to cooperate with the Army and Navy in the development of improved weapons and equipment.

"This new group will serve as a connecting link between the laboratory and the production line, making certain that the latest scientific advances are used to the best advantage in increasing the efficiency of the nation's armed forces," Mr. Smith said.

It will carry out a long-range program, coordinating the work formerly done by many different departments. For the present this will not be a large group but will be adequate to maintain close contact between Westinghouse and the Army and Navy. At the present time, the company expects to devote most of the efforts of this group to the development of improved Army and Navy ordnance equipment and to the development of airborne equipment for military purposes."

Manager of the special products engineering department will be Dr. W. H. Brandt, who was one of 25 technical and scientific consultants that cooperated with the United States Strategic and Technical Air Forces in translating and organizing secret reports of German research in aeronautics and kindred fields. He has been assistant manager of the materials engineering department at Westinghouse.

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NEWS OF INDUSTRY

Bureau of Mines Data Shows Zinc Production Fell 3 Pct During May

• • • Although the total mine production of zinc in May was relatively unchanged from April, the average daily rate of output declined 3 pct, according to the Bureau of Mines, U. S. Dept. of the Interior. The average daily production in May was 1536 short tons compared with 1582 tons in April. Continued labor difficulties at the mines and smelters throughout the United States, the national railroad strike, and, to some extent, the national coal mine strike were the principal factors contributing to the declining rate of output.

In the Eastern and Central States the production of zinc remained nearly unchanged. Operations were resumed on May 5 at the mines of the American Zinc Co. of Tennessee in Knox and Jefferson Counties, Tenn., following a labor strike which had closed the properties since Feb. 2.

The daily rate of zinc output in the combined western states continued the downward trend in evidence since February. Operations at mines producing both zinc and lead concentrates were restricted by the labor strikes which closed the smelters of the American Smelting & Refining Co. early in the year. Mines with limited storage facilities or dependent upon prompt payments for smelter ship-

ments to cover basic operating expenses were compelled to close. All states except Montana, New Mexico, and Washington, recorded declines in the rate of zinc output.

Distributes New Standards Washington

• • • The Div. of Simplified Practice, Bureau of Standards, has distributed a proposed revision of the simplified practice recommendation for grinding wheels (R45) to manufacturers, distributors and users. The proposed revision is presented in an illustrated 72-page processed booklet. The proposal adds a number of shape types to the list contained in the 1939 revision, including three types for cones, four for plugs and three for wheels.

One important change is in the method of classification. Part I of the proposal classifies abrasive wheels by "Shape Types." Part II classifies the same "Shape Types" by their common uses. The proponents of the proposed revision believe that it will be possible to select a suitable wheel for every present day practical need from the list in Part II.

The recommended sizes for new machine design are given under each classification in Part II. If new machines are designed in accordance with these recommendations, the proposal states, the simplification of grinding wheels with its attendant benefits will become progressively more effective.

Mine production of recoverable zinc in the United States, in 1945, and January-May, 1946, in short tons

Region and State	1945 (monthly average)	1946		
		January-March (monthly average)	April*	May
Eastern States.....	13,004	12,440	12,563	12,773
Central States.....	13,650	14,377	14,674	14,580
Western States:				
Arizona.....	3,194	3,493	1,600	1,500
California.....	777	617	770	700
Colorado.....	2,982	3,248	2,858	2,889
Idaho.....	6,448	6,618	8,160	5,660
Montana.....	2,529†	2,143	1,250	1,500
Nevada.....	1,640	1,897	2,200	2,250
New Mexico.....	3,248	2,797	2,490	2,683
Utah.....	2,664	2,067	1,900	1,930
Washington.....	959	989	1,000	1,150
	24,340	23,869	20,228	20,262
Total United States.....	51,000	50,686	47,465	47,615

* Revised figures.

† Includes some zinc contained in foreign material treated in Montana.

Remelt Lead Output Increases Greatly Due to Subsidies

Washington

••• Secondary lead recovery continued at a high level in 1945, with 363,039 short tons of lead valued at \$46,468,992 recovered from scrap, compared with 331,416 tons valued at \$42,421,248 recovered in 1944, according to the Bureau of Mines. This increase in production from secondary sources did much to offset declining domestic production and dwindling imports of primary lead.

Production of soft lead from scrap rose 15 pct, from 61,700 tons in 1944 to 70,951 tons in 1945, and the secondary lead content of antimonial lead produced rose 7 pct, from 180,818 tons in 1944 to 194,079 tons in 1945. Secondary lead recovered in solder declined from 22,245 tons in 1944 to 19,964 tons in 1945, whereas the secondary lead content of type metals produced showed a moderate increase for the first time in several years—28,525 tons in 1945 compared with 23,870 tons in 1944 and 23,201 tons in 1943. Data furnished by responding companies revealed that the primary metal content of secondary lead products increased slightly, but total production of the secondary lead industry showed a substantial gain during the year.

Of the total secondary lead recovered, 339,024 short tons were reclaimed from lead- and tin-base scrap; the remaining 24,615 tons were contained in secondary brass and bronze and reclaimed by remelting copper-base scrap. A total of 5731 tons of lead in lead-base scrap was added to brass and bronze, bringing the total recovery of secondary lead in this type of product to 30,346 tons.

Consumption of lead-base scrap totaled 472,495 tons gross weight in 1945, compared with 429,261 tons in 1944. The use of battery lead plates rose 33,213 tons, of drosses and residues 8786 tons, of hard lead scrap 4556 tons, of cable lead scrap 1067 tons, and of type metal scrap 532 tons; but consumption of solder and tinny-lead scrap declined 2543 tons, of soft lead 2051 tons, and of mixed common babbitt scrap 326 tons.

The best index of activity at plants of secondary lead smelters and remelters is their consumption of scrap each month. Consumption of all lead-base items reached a low point for the year in February, and gained until May, after which it declined sharply to another low point in August, then climbed sharply to the year's peak of activity in October. Manufacturers and foundries used 18,580 tons, or 4 pct, of the total lead-base scrap consumed and the remaining 453,915 tons, were consumed by remelters, smelters, and refiners.

Throughout 1945 the demand for lead was considerably in excess of supply, necessitating a constant drain on Metals Reserve Co. stockpiles of the metal. This critical situation was attributable to the manpower shortage throughout both the primary and secondary branches of the industry. Early in January, WPB officials met with lead producers in an effort to increase secondary output. As a result, secondary lead production

was placed on the national production urgency list in order to assist the War Manpower Commission in determining manpower priority ratings. Another boost in secondary lead production was brought about by a program effected through the assistance of Metals Reserve Co., for converting low-grade lead byproducts to usable metal. Much of this idle material in the hands of dealers and secondary smelters was shipped to plants equipped to handle it, with the government paying a subsidy in the form of transportation cost.

Consumers' inventories of lead scrap rose from 71,598 tons on hand Dec. 31, 1944 to 79,974 tons at the end of 1945. Stocks of both soft lead scrap and the lead-base alloys increased, whereas inventories of drosses and residues declined, probably as a result of the campaign for the reduction of this material. During the same period stocks of secondary pig, bar, and ingot metals at these plants increased from 17,709 short tons to 28,982 tons.

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3 New Annealing Furnaces

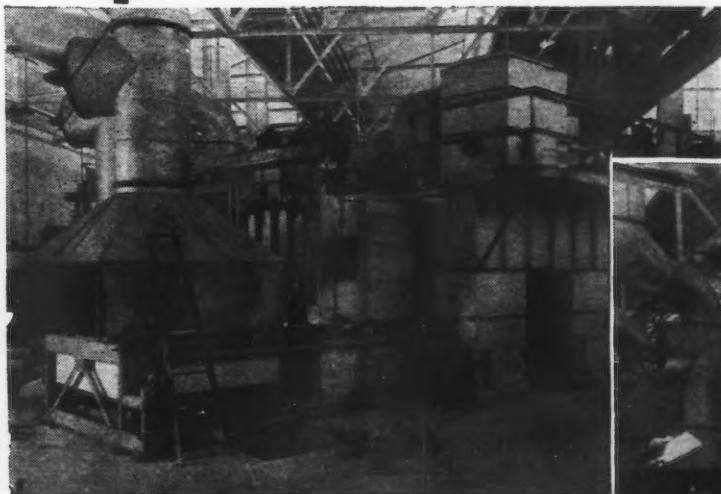
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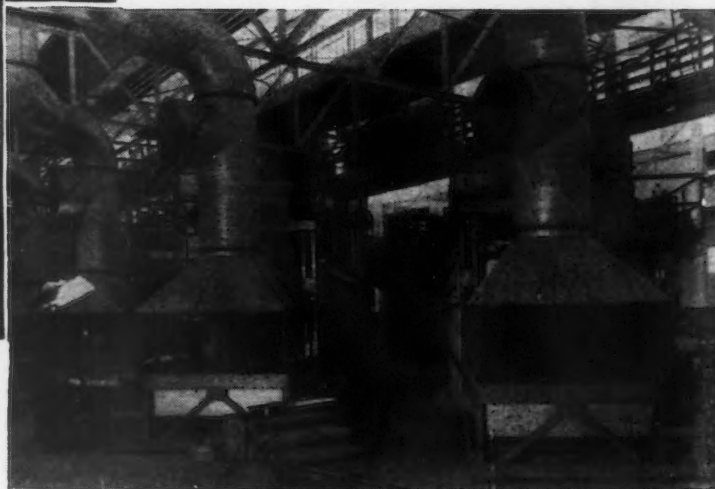
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